IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of:	Jeffry Jovan Philyaw
Serial No.:	09/382,421
Confirmation No.:	5215
Filed:	August 24, 1999
Group:	2141
Examiner:	Le Hien Luu
For:	COMBINED PRODUCT CODE AND INSIGNIA FOR SIGNIFYING AN INTERNAL INTERACTIVE CODE

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BRIEF ON APPEAL

This Brief is submitted in connection with an appeal from the final rejection of the Examiner, dated March 31, 2006, finally rejecting claims 1-9, all of the pending claims in this application.

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II. REAL PARTY IN INTEREST

The real party in interest is L.V. Partners, L.P., a United States Company having a principal office and place of business at 2626 Cole Avenue, Dallas, Texas 75204.

III. RELATED APPEALS AND INTERFERENCES

Applicant has the following related application pending appeals: U.S. Patent Application Serial No. 07/614,937, Appeal No. 2007-1745 entitled "LAUNCHING A WEB SITE USING A PASSIVE TRANSPONDER" (Atty. Dkt. No. PHLY-27,356), filed on July 11, 2000; and U.S. Patent Application Serial No. 10/884,377 entitled "OPTICAL READER WITH ULTRAVIOLET WAVELENGTH" (Atty. Dkt. No. PHLY-26,826) filed on July 2, 2004.

Applicant has filed Notices of Appeal in the following related applications: U.S. Patent Application Serial No. 09/382,374, entitled "METHOD AND APPARATUS FOR ALLOWING A BROADCAST TO REMOTELY CONTROL A COMPUTER" (Atty. Dkt. No. PHLY-24,736), filed on August 24, 1999; U.S. Patent Application Serial No. 09/382,423, entitled "METHOD AND APPARATUS FOR UTILIZING AN AUDIBLE SIGNAL TO INDUCE A USER TO SELECT AN E-COMMERCE FUNCTION" (Atty. Dkt. No. PHLY-24,739), filed on August 24, 1999; U.S. Patent Application Serial No. 09/417,863, entitled "SOFTWARE DOWNLOADING USING A TELEVISION BROADCAST CHANNEL" (Atty. Dkt. No. PHLY-24,767), filed on October 23, 1999; U.S. Patent Application Serial No. 09/494,924, entitled "INPUT DEVICE FOR ALLOWING INTERFACE TO A WEB SITE IN ASSOCIATION WITH A UNIQUE INPUT CODE" (Atty. Dkt. No. PHLY-24,913), filed on February 1, 2000; U.S. Patent Application Serial No. 09/659,170, entitled "ACCESSING A VENDOR WEB SITE USING PERSONAL ACCOUNT INFORMATION RETRIEVED FROM A CREDIT CARD COMPANY WEB SITE" (Atty. Dkt. No. PHLY-25,340), filed on September 11, 2000; U.S. Patent Application Serial No. 09/602,034 entitled "CONTROLLING A PC USING A TONE FROM A CELLULAR TELEPHONE" (Atty. Dkt. No. PHLY-25,337), filed on June 23, 2000; U.S. Patent Application Serial No. 09/659,520, entitled "LAUNCHING A

WEB SITE USING A PERSONAL DEVICE" (Atty. Dkt. No. PHLY-25,355), filed on September 12, 2000.

There are no related interferences regarding the above-identified patent application.

IV. STATUS OF CLAIMS

Claims 1-9 are pending, stand firmly rejected, and are on appeal here. Claims 1-9 are set forth in the CLAIMS APPENDIX attached hereto.

V. STATUS OF AMENDMENTS

A Response was filed after the mailing of the Final Rejection dated March 31, 2006, although no amendments to the claims were presented in the Response.

VI. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention, as now set forth in independent Claim 1, relates to a visual indicia for facilitating computer based access of a network by a consumer. The visual indicia is comprised of a machine readable code (page 38 lines 18-19) disposed on a surface of a product (reference number 1606 of Fig 16, page 34 lines 22-26, page 38 lines 19-22, reference number 2502 of Fig 25, page 50 lines 4-5) and having encoded therein information related to the product (page 34, lines 22-26), which product is provided by the product manufacturer (page 34 lines 10-15), and which machine readable code is physically associated with the product itself (page 34, lines 22-26), which machine readable code has no routing information contained therein to allow a user to access any location on a network (page 35 lines 5-10), and which machine readable code has a relationship to the product or service unrelated to routing information (page 35 lines 5-10); the machine readable code being a part of a relational database (page 35, lines 5-10) that associates the machine readable code with a defined location on the network (page 16, line 6 – page 17, line 4) and the relational database associated with a routing system that facilitates connection to the remote location on the network (page 16, line 11 – page 17, line 4); and a visual indicia (reference number 2504 on Fig 25, page 50, line 6 – page 51, line 8) having no

apparent relationship to the machine readable code or to the defined location (page 50, line 6 – page 51, line 8) disposed on said surface (page 50, lines 4-8) in a predetermined proximate visual orientation to said machine readable code (page 50, lines 4-8) and the visual indicia associated only with the routing system and not with the product manufacturer (page 50, lines 6-16), such that the machine readable code and the visual indicia together form a defined composite visual appearance (reference number 2506, on Fig 25b, page 50 lines 17-22), indicative of a relationship between said machine readable code and the presence of a location on a network (reference number 2506, on Fig 25b, page 50 lines 17-22) that will use the routing system for connection to the remote location and that such location on the network can be accessed by a computer having an appropriate input device for reading said machine readable code (reference number 2506, on Fig 25b, page 50, line 17 – page 51, line 8), such that reading of said machine readable code by said input device will cause the routing system to connect the computer to the remote location (page 50, line 17 – page 51, line 8), and wherein the visual indicia indicates only that scanning of the machine readable code will cause computer based access of the network by the routing system (page 50, line 6 – page 51, line 8).

The present invention, as now set forth in dependent Claim 2, relates to the indicia of Claim 1, wherein said visual indicia is not machine readable. (reference number 2504 on Fig 25, page 50, line 6 – page 51, line 8).

The present invention, as now set forth in dependent Claim 3, relates to the indicia of Claim 1, wherein said machine readable code represents a product. (reference 2502 on Fig 25, page 49, line 19 – page 50, line 3).

The present invention, as now set forth in dependent Claim 4, relates to the indicia of Claim 3, wherein said machine readable code is disposed directly on a product. (reference 2502 on Fig 25, page 49, line 19 – page 50, line 19).

The present invention, as now set forth in dependent Claim 5, relates to the indicia of Claim 3, wherein said machine readable code is disposed in close association with said product. (reference 2502 on Fig 25, page 50, lines 4-7).

The present invention, as now set forth in dependent Claim 6, relates to the indicia of Claim 3, wherein said machine readable code is a UPN. (page 49, line 24 – page 50, line3)

The present invention, as now set forth in dependent Claim 7, relates to the indicia of Claim 3, wherein the machine readable code is an ISBN.

The present invention, as now set forth in dependent Claim 8, relates to the indicia of Claim 3, wherein the machine readable code is an EAN.

The present invention, as now set forth in dependent Claim 9, relates to the indicia of Claim 1, wherein the input device for reading said machine readable code is a scanner. (reference number 1600 on Fig 16, page 33, lines 1-26, page 43, lines 5-7)

VII. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-9 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,064,979 to Perkowski ("*Perkowski*") and in view of U.S. Patent No. 6,394,354 to Wilz, Sr. et al. ("*Wilz*").

VIII. ARGUMENT

As detailed below, the Applicant believes that the Examiner has improperly applied the *Perkowski* and *Wilz* references to Claims 1-9. More specifically, it is Applicant's belief that the §103 rejections based on the combination of *Perkowski* and *Wilz* are clearly not proper and are without basis and that the Examiner has failed to state a *prima facie* case as to have the combination of *Perkowski* and *Wilz* could constitute a viable combination of references under 35 U.S.C. § 103. .

A. Rejections under 35 U.S.C. §103

MPEP §2142 specifies that:

> The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.

In regard to what an examiner must show in order to establish a prima facie case of obviousness, MPEP §2142 further explains that:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. . . . Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

In regard to what an examiner must do in order to meet the first criterion for a prima facie rejection, MPEP §2143.01 specifies that:

> Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art.

In the present application, as explained in more detail below, the various combinations of references proposed by the Examiner are not supported by a proper suggestion or motivation to make each proposed modification. This means that the first criterion for a *prima facie* rejection has not been met, which in turn means the Examiner has failed to carry the burden of establishing a *prima facie* rejection. In addition, certain claim limitations are not taught or suggested by the cited combinations, which means that the third criterion for a *prima facie* rejection has not been met and that the Examiner has further failed to carry the burden of establishing a prima facie rejection for this independent reason. Nor has the Examiner put forth any arguments or provided any articulated reasoning as to how any deficiency (missing element) could be solved in a predictable manner through combination with any other reference.

1. In re Kahn

With respect to obviousness, a claimed invention is unpatentable if the differences between it and the prior art are "such that the subject matter as a whole would have been obvious

at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. § 103(a) (2000); *In re Kahn*, 441 F.3d 977, 985 (Fed. Cir. 2006) (citing *Graham v. John Deere Co.*, 383 U.S.1, 13-14, 86 S.Ct. 684, 15L, Ed. 2d 545, 1962). Obviousness is a question of law, based upon underlying factual questions which are reviewed for clear error following a bench trial. These "underlying factual inquiries include: (1) The scope and content of the prior art; (2) The level of ordinary skill in the prior art; (3) The difference between the claimed invention and the prior art; and (4) Objective evidence of nonobviousness." *In re Dembiczak*, 175 F.3d 994, 998 (Fed. Cir. 1999).

In *Kahn* the Court noted that:

> ". . .to reject claims in an Application under § 103, an Examiner must show and unrebutted *prima facie* case of obviousness . . . on appeal to the board, an Applicant can overcome a rejection by showing insufficient evidence of a *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness." (*Kahn* at 985).

When combining references, it is well recognized that "[m]ost inventions arise from a combination of old elements and each element may often be found in the prior art." *In re Rouffett*, 149 F.3d 1350, 1357. "However, mere identification in the prior art of each element is insufficient to defeat the patentability of the combined subject matter as a whole." *Kahn* at 986, citing *Rouffett* at 1355, 1357. *Kahn* further states:

> Rather, to establish a *prima facie* case of obviousness based on a combination of elements disclosed in the prior art, the Board must articulate the basis on which it concludes that it would have been obvious to make the claimed invention. *Id.* In practice, this requires that the Board "explain the reasons one of the ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious." *Id. at 1357-59.* This entails consideration of both the "scope and content of the prior art" and the "level of ordinary skill in the pertinent art" aspects of the Graham test. (*Kahn at 986*).

The primary test that has been put forth by the Federal Circuit is the motivation-suggestion-teaching test. *Kahn* set forth that, when there is no explanation provided by the Board to explain the motivation, or the suggestion or the teaching, that would have led a skilled artisan at the time of the invention to the claimed combination as a whole, then the court would infer that hindsight was utilized to conclude that the invention was obvious. *Kahn* relied upon the *Rouffett* case for this teaching at 1358. The "motivation-suggestion-teaching" requirement was set forth to protect against the entry of hindsight into the obviousness analysis, a problem which §103 was meant to confront. Thus, in order to establish a *prima facie* case, some explanation as to motivation, suggestion or teaching of each of the references and how they can be combined is required.

Although *Kahn* sets forth the motivation-suggestion-teaching test, there is still the "analogous-art" test that must be applied, this being one test that was articulated by the Supreme Court as part of the *Graham* analysis. See *Dann v. Johnston*, 425 U.S. at 219, 226, 96 S. Ct. 1393, 47 L.Ed 2d 692 (1976). "The analogous-art test requires that the Board show a reference is either in the field of the Applicant's endeavor or is reasonably pertinent as to the problem with which the inventor was concerned in order to rely on that reference as a basis for rejection." (*Kahn at 987*). The following was further stated by *Kahn*:

> References are selected as being reasonably pertinent to the problem based on the judgment of a person having ordinary skill in the art. *Id.* ("It is necessary to consider the reality of the circumstances, in other words, common sense--in deciding in which fields a person of ordinary skill would reasonably be expected to look for a solution to the problem facing the inventor." (quoting *In re Wood*, 599 F.2d 1032, 1036 (C.C.P.A. 1979)). We have explained that this test begins the inquiry into whether a skilled artisan would have been motivated to combine references by defining the prior art relevant for the obviousness determination, and that it is meant to defend against hindsight. See *id.*; *In re Clay*, 996 F.2d 656, 659-60 (Fed. Cir. 1992). N3" (*Kahn at 987*)

As such, the first step of analyzing the combination provided by the Examiner is to examine the references and determine if the combination satisfies the analogous-art test. The next step for determining obviousness is to analyze the motivation-suggestion-teaching test which:

> . . . picks up where the analogous art test leaves off and informs the Graham analysis. To reach a non-hindsight driven conclusion as to whether a person having ordinary skill in the art at the time of the invention would have viewed the subject matter as a whole to have been obvious in view of multiple references, the Board must provide some rationale, articulation, [**23] or reasoned basis to explain why the conclusion of obviousness is correct. The requirement of such an explanation is consistent with governing obviousness law, see *§ 103(a)*; *Graham*, 383 U.S. at 35; *Dann*, 425 U.S. at 227-29, and helps ensure predictable patentability determinations. (*Kahn* at 987).

Even if all of the elements of a claim are disclosed in various prior art references, the long-standing rule that a claimed invention, as a whole (*In re Hiraro*, 535 F.2d, 67, (C.C.P.A. 1966)), cannot be said to be obvious unless there is some reason or motivation given in prior art why someone would have been prompted to combine the teachings or the references. (*In re Regel*, 526 F.2d, 1399 (C.C.P.A. 1975); *In re Bond*, 910 F.2d, 831, (Fed. Cir. 1990)). The prior art itself may suggest desirability of a combination, or the motivation may come from other sources (for example, economic factors). (See e.g. *In re Clinton*, 527 F.2d 1226 (C.C.P.A. 1976); *Cable Elec. Prods., Inc. v. Genmart, Inc.*, 77 F.2d, 1015 (Fed. Cir. 1985)). Thus, the motivation to combine the relevant art or teachings does not have to be found explicitly in the prior art but, rather, can be implicit thereto. "However, rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." (*Kahn* at 998 referring to *Lee*, 277, F.3d at 1343-46 and *Rouffett*, 149 F.3d at 1355-59). The purpose of such requirement is to ensure "due process and non-arbitrary decision making", as it is in § 103. (*Kahn* at 988).

Kahn articulated the considerations for motivation when analyzing obviousness. The Court stated "the problem examined is not the specific problem solved by the invention, but the

general problem that confronted the inventor before the invention was made." (*Kahn* at 988 referring to *Cross Medical Products, Inc. v. Metronics Sofamore Danek, Inc.*, 424 F.3d 1293, 1323 (Fed. Cir. 2005)). In the reference in *Cross*, the quote that was cited by the Court (*Cross* at 1323) was that "one of ordinary skill in the art need not see the identical problem addressed in the prior art reference to be motivated to apply its teachings." As to motivation, the Courts upheld that the evidence of motivation to combine the prior art references "may flow from the prior art references themselves, knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved." *Medichem I.V.*, 437 F.3d at 1165, quoting *Brown and Williamson Tobacco Corp. v. Phillip Morris, Inc.*, 229 F.3d, 1120, 1125 (Fed. Cir. 2000). *Kahn* summarized the motivation-suggestion-teaching test as follows:

> Therefore, the "motivation-suggestion-teaching" test asks not merely what the references disclose, but whether a person of ordinary skill in the art, possessed with the understandings and knowledge reflected in the prior art, and motivated by the general problem facing the inventor, would have been led to make the combination recited in the claims. See *Cross Med. Prods.*, 424 F.3d at 1321-24. From this it may be determined whether [**26] the overall disclosures, teachings, and suggestions of the prior art, and the level of skill in the art–i.e., the understandings and the knowledge of persons having ordinary skill in the art at the time of the invention–support the legal conclusions of obviousness. See *Princeton Biochemicals*, 411 F.3d at 1338 (pointing to evidence supplying detailed analysis of the prior art and the reasons one of ordinary skill would have possessed the knowledge and motivation to combine). *Kahn* at 988.

In *Alza Corporation v. Mylan Laboratories, Inc.*, 464 F.3d 1286 (12006) Fed. Cir., No. 06-1019, 9/6/06.

The Federal Circuit has responded to arguments made during pendency of the recently decided Supreme Court case, *KSR International Co v. Teleflex Inc, et al.*, 550 U.S. (2007) and has spelled out its law on obviousness, insisting that it is in harmony with Supreme Court precedent.

In the facts of this case, *Alza* sued Mylan for infringement of its patent (6,124,355) under 35 U.S.C. §271(e)(2) after Mylan sought FDA approval to market a generic version of oxybutynin,

a drug used to treat urinary incontinence. The Federal Circuit affirmed the obviousness and non-infringement decisions of the district court.

In the process, Judge Arthur Gajarsa dedicated five pages of his opinion to then outline the Federal Circuit's law on obviousness, responding to many arguments made in the pending Supreme Court case of *KSR Int'l Co. v. Teleflex, Inc.* (U.S. No. 04-1350). KSR and many amici, including the U.S. government, have challenged the Federal Circuit rule that proof of obviousness must include a showing of a "teaching, suggestion, or motivation" to combine the prior art elements of the claimed invention. *KSR* and others have said that this requirement is too rigid and is inconsistent with Supreme Court decisions issued since *Graham v. John Deere Co.*, 383 U.S. 1 (1966)

Judge Gajarsa wrote the following in his *Alza* opinion:

> This requirement has been developed consistent with the Supreme Court's obviousness jurisprudence as expressed in *Graham* and the text of the obviousness statute that directs us to conduct the obviousness inquiry "at the time the invention was made" 35 U.S.C. §103. As we explained in [*In re Kahn*, 441 F.3d 977 (Fed. Cir. 2006)],
>
> > The motivation-suggestion-teaching test picks up where the analogous art test leaves off and informs the *Graham* analysis. To reach a non-hindsight driven conclusion as to whether a person having ordinary skill in the art at the time of the invention would have viewed the subject matter as a whole to have been obvious in view of multiple references, the Board must provide some rationale, articulation, or reasoned basis to explain why the conclusion of obviousness is correct. The requirement of such an explanation is consistent with governing obviousness law . . . .
>
> 441 F.3d at 987. We further explained that the "motivation to combine" requirement "[e]ntails consideration of both the 'scope and content of the prior art' and 'level of ordinary skill in the pertinent art' aspects of the *Graham* test." Id. at 986.
>
> At its core, our anti-hindsight jurisprudence is a test that rests on the unremarkable premise that legal determinations of obviousness, as with such determinations generally, should be based on evidence rather than on mere speculation or conjecture. Our court's analysis in *Kahn* bears repeating:

> A suggestion, teaching, or motivation to combine the relevant prior art teachings *does not have to be found explicitly in the prior art*, as "the teaching, motivation, or suggestion may be implicit from the prior art as a whole, rather than expressly stated in the references.... The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." However, rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be *some* articulated reasoning with *some* rational underpinning to support the legal conclusion of obviousness. This requirement is as much rooted in the Administrative Procedure Act [for our review of Board determinations], which ensures due process and non-arbitrary decision making, as it is in § 103.

441 F.3d at 987-88 (quoting *In re Kotzab*, 217 F.3d 1365, 1370 (Fed. Cir. 2000)) (citations omitted) (emphases added)). There is flexibility in our obviousness jurisprudence because a motivation may be found *implicitly* in the prior art. We do not have a rigid test that requires an actual teaching to combine before concluding that one of ordinary skill in the art would know to combine references. This approach, moreover, does not exist merely in theory but in practice, as well. Our recent decisions in *Kahn* and in [*Cross Med. Prods., Inc., v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293 (Fed. Cir. 2005)] amply illustrate the current state of this court's views.

2. KSR

The recently issued Supreme Court Case in *KSR* has basically held that the federal circuit's Teaching, Suggestion or Motivation (TSM) test to combine known elements in order to show that the combination is obvious is too rigid. The Court reinforced their position that analysis in *Graham* have been reaffirmed. The Court indicated that it's holding was that a "patent for a combination which only unites old elements with no change in their respective functions. . . obviously withdraws what is already known into the field of its monopoly and diminishes the resources available to skillful men." Citing *Great Atlantic & Pacific Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 152 (1950). (*Kahn* at page 12.) The Court stated that this was a "principal reason for declining to allow patents for what is obvious. The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." (*KSR,* page 12.) The Court further went on to

indicate that there were three cases that illustrated the application of this doctrine of predictability. The first case was *United States v. Adams*, 383 U.S. 39, 40 (1966). In discussing this case, the Court noted that it had "relied upon the corollary principal that when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be non-obvious." (*KSR* at page 12.) In the second case, *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57 (1969), the Court reiterated "while the combination of old elements performed a useful function, it added nothing to the nature and quality of the radiant-heat burner already patented." (*KSR* at page 13.) In the third case, *Sakraida v. AGPro, Inc.*, 425 U.S. 273 (1976), the Court stated that "when a patent 'simply arranges old elements with each performing the same function it had been known to perform' and yields no more than one would expect from such an arrangement, the combination is obvious." Citing *Sakradia* at 282, (*KSR* at page 13).

The Court summarized these three cases as follows:

> The principles underlying these cases are instructive when the question is whether a patent claiming the combination of elements of prior art is obvious. When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. *If a person of ordinary skill can implement a predictable variation, §103 likely bars its patentability.* For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Sakraida* and *Anderson's-Black Rock* are illustrative-a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.(Emphasis added.) (*KSR* at page 13.)

The Court recognized that following the above stated principals might involve more than "the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement." (*KSR* at page 14.) The Court noted that it might "be necessary for a Court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the

background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claim by the patent that issued." (*KSR* at page 14.) However, the Court also noted that the analysis should be "made explicit." citing *In Re: Kahn*, 441 F.3d 977, 988 wherein *Kahn* stated that "rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead there must be some articulated reason with some rational underpinning to support the legal conclusion of obviousness." (*KSR* at page 14.) The Court noted that, however, "the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." (*KSR* at page 14.)

Although the Court in this opinion rejected the rigidity of the TSM test, there was some reference to the decision in *Alza* wherein the Court noted the Federal Circuit's position that "there is flexibility in our obviousness jurisprudence because the motivation may be found *implicitly* in the prior art. We do not have a rigid test that requires an actual teaching to combine. . . ," citing *Alza* at 1291, (*KSR* at page 18). However, the Court also noted that the *Alza* decision was not before it and that, although they may describe an analysis more consistent with the Court's earlier precedence, the Court of Appeals would have to consider the current decision in view of its future cases.

B. 35 U.S.C. § 103 Rejection

Applicant submits that the Examiner has taken the approach wherein he has simply broken Applicant's invention into its component parts and then attempted to find a prior art reference corresponding to each component. However, In order to prove obviousness with the combination of *Perkowski* and *Wilz*, the two references relied upon by the Examiner, the Examiner must provide an explanation as to whether the overall disclosures of these references, the teachings therein and the suggestions associated therewith, in addition to the level of skill in the art, support the Examiner's conclusion of obviousness as to the invention as a whole. As such, Applicant believes that the Examiner's combination of *Perkowski* and *Wilz* is conclusory.

Therefore, Applicant submits that support for the combination is based on hindsight and the combination is therefore improper, as will be discussed herein in detail.

As will be discussed below in greater detail with respect to specific paragraphs of the Final Office Action (dated March 31, 2006) and Office Action (dated September 3, 2004), the reasoning provided by the Examiner fails to meet the required standard. As a preliminary matter, Applicant notes that the Examiner relies on *In re Morris*, *In re Prater*, and *In re Zletz* and, while all are valid cases, they are also nine, thirty-seven, and seventeen years old, respectively. Although the general premises are correct, it is preferable that the more recent cases be examined. Applicant has presented more recent cases, specifically, *Kahn, Alza* and *KSR* in which the standard for obviousness is clearly set forth.

For convenience, the following paragraphs refer to paragraph numbers of the Final Office Action dated March 31, 2006 and Office Action dated September 3, 2004, as appropriate. It is noted that some paragraphs from the Final Office Action (dated March 31, 2006) and Office Action (dated September 3, 2004) are not addressed directly, but Applicant has included them in the present Brief in order to add context.

1. Independent Claim 1 as rejected by the combination of *Perkowski* and *Wilz*

Paragraph 4 of the Office Action (dated March 31, 2006) and Paragraph 5 of the Office Action (dated September 3, 2004) and Paragrpah 1 of the Advisory Action Before Filing of an Appeal Brief, dated October 13, 2006, each state that:

> "[as to] claim 1, Perkowski teaches the invention substantially as claimed, including a visual indicia for facilitating computer based access of a network by consumer, comprising:
>
> a machine readable code disposed on a surface of a product and having encoded therein information as to the product, which product is provided by the product manufacturer, and which machine readable code is physically associated with the product itself, which machine readable code has no routing information

contained therein to allow a user to access any location on a network, and which machine readable code has a relationship to the product or service unrelated to routing information (col. 10 lines 14-33; UPC or UPN has relationship to a product or service but has no routing information);

the machine readable code being a part of a relational database that associates the machine readable code with a defined location on the network and the relational database associated with a routing system that facilitates connection to the remote location on the network (col. 6 lines 26-56); and

a visual indicia having no apparent relationship to the machine readable code, such that the machine readable code and the visual indicia together form a composite visual appearance (Perkowski, col. 4 lines 5-23; col. 20 lines 9-14; col. 21 line 52 – col. 22 line 19; trademark symbol or logo or company name is printed on service or product with bar code), indicative of a relationship between said machine readable code and the presence of a location on a network that will use the routing system for connection to the remote location and that such location on the network can be accessed by a computer having an appropriate input device (Perkowski, bar code reader or scanner) for reading said machine readable code, such that reading of said machine readable code by said input device will cause the routing system to connect the computer to the remote location (col. 10 line 14 – col. 11 line 16; col. 15 lines 9-43).

However, Perkowski does not explicitly teach the visual indicia associated with the routing system and indicates that scanning of the machine readable code will cause computer based access of the network.

Wilz teaches each URL encoded bar code symbol (machine readable code) is printed above each Web-site URL (visual indicia) which indicates that scanning of the URL encoded bar code3 (sic) symbol will cause computer based access the Web-site URL (col.2 lines 49 – col. 3 line 12; col. 7 lines 20-40; col. 16 line 61 – col. 17 line 18)."

As Applicant stated in the Response filed on December 3, 2004 responding to the September 3, 2004 Office Action, the Examiner is utilizing the *Perkowski* reference as teaching a machine readable code that is physically associated with the product, e.g., a bar code. Applicants

agree that *Perkowski* does show a bar code that is associated with the product and that it is physically associated with the product itself. However, as compared to the Applicant's present inventive concept, *Perkowski* merely provides a trademark logo associated with the bar code. There is no functional purpose that a user would make of the trademark or the visual indicia. The *Perkowski* machine readable code has no routing information contained therein. The *Perkowski* reference does disclose the inclusion of the machine readable code in a relational database that associates the machine readable code with a defined location on the network. The Examiner is of the opinion that *Perkowski* discloses a visual indicia disposed on the surface in a predetermined proximate visual orientation to the machine readable code, such that the machine readable code and the visual indicia together form and define a composite visual appearance. The Examiner has cited Column 4, lines 5-23, Column 20, lines 9-14 and Column 21, lines 52-62 for support of this position by defining the trademark symbol as the visual indicia that is printed on the product with the bar code. Applicant respectfully traverses these comments for the following reasons.

Column 4, lines 5-23 of *Perkowski* is reproduced below.

> Another object of the present invention is to provide such a system, wherein during the "UPSN Search Mode" of the system, a predesignated information resource (e.g. advertisement, product information, etc.) pertaining to any commercial product or service registered with the system can be automatically accessed from the Internet and displayed from the Internet browser by simply entering the registered product's trademark(s) and/or associated company name into the Internet browser.
>
> Another object of the present invention is to provide such a system, wherein a predesignated information resource pertaining to any commercial product or service having been assigned a Universal Product Number (UPN) or Universal Service Number (USN) can be accessed from the Internet and displayed from the Internet browser by simply selecting its IPSI Finder button and then entering the UPN or USN number string into a dialogue box which pops up on the display screen of the Internet browser program.

Column 20, lines 9-14 of *Perkowski* is reproduced below, which sets forth an exemplary display screen:

> "Simply enter the trademark used in connection with the particular product and/or the company name of the product's manufacturer; click REQUEST, and then wait for the display of a list of Web locators (URLs) at which desired types of product information can be found on the Internet."

Column 21, lines 52-62 of Perkowski is reproduced below:

> When practicing the system and method of the present invention, it is preferred that the UPC label (with its human-readable UPC number) assigned to the particular product be attached, embossed or otherwise embodied on an accessible surface thereof. In addition to applying the UPC label to the external packaging of the product, it is preferred that the UPC label also be printed on any and all product instructions and manuals provided with the product. In this way, the UPC number can be easily read by a human being and then used to access a desired type of product information using the system and method of the present invention.

Column 21, lines 63 through Column 22, line 11 of *Perkowski* is reproduced below:

> In order that the system hereof can be used to find information pertaining to large products such as automobiles, motorcycles, skidoos, farm machinery, boats, etc., the present invention also contemplates assigning UPC numbers to such products and attaching, embossing or otherwise embodying the same on an accessible surface thereof. Also, the UPC label should be printed on all instruction booklets and/or operating manuals normally provided with the product that is posted anywhere on the Internet and linked to URLs registered with the IPSD Servers of the system hereof can be readily found using the uniquely assigned UPC number assigned thereto by the manufacturer at the time of sale. Notably, multimedia information about such products can be most helpful in regard to the operation, repair and servicing of such products.

As set forth in Applicant's response dated December 8, 2003, Applicant noted that *Perkowski* does not dispose the visual indicia on the product surface in a "predetermined proximate visual orientation" to the machine readable code. This relationship is not shown in *Perkowski*, as *Perkowski* merely provides the bar code on the surface of a product or a brochure, this typically being on a brochure Web page. The above identified discussion relates to a bar

code disposed on a product, on instruction booklets associated therewith or on operating manuals.

Perkowski is a reference that is directed towards the concept of providing an interface to a user to allow that user to search information regarding either a product having an associated UPC or UPN or information regarding products associated with the trademark (noting this association is not disclosed as being on a product or brochure), there are provided two methods of operation. This is described beginning at column 18, line 55 in the section entitled "Operation of the IPSI Finding System and Method." Each of these systems utilizes a browser programmed as the GUI-based interface for the user. The two independent modes of operation are the "IPSI Find Mode" and the "UPSN Search Mode" system (column 18, line 60-61). The operation of this mode is best set forth in column 19, lines 12-40, set forth as follows:

> When the system is in this operational mode, as illustrated in FIGS. 3A, 4A and 5A, 6A, a Web-based information resource pertaining to any commercial product or service registered with the system can be displayed and selected by the user in order to automatically access the same from the Internet. Such information resources can include advertisements, specifications, operation descriptions, product simulations, purchase information, maintenance information, warranty and servicing information, product updates, distributor information, incentives (e.g. discounts, rebates, coupons, etc.), electronic data transaction screens, etc. In this mode, desired product or service information is obtained by simply manually entering the registered product's UPN (e.g. its UPC's 12 digit numerical string) or the registered service's USN (e.g. its UPC's 12 digit numerical string) into the dialogue box of the Internet browser or Internet application tool. When using the seeded IPSI Database described hereinabove, only the first six digits of the UPC number need be entered into the dialogue box. An exemplary display screen produced from the IPSD Server might be as follows:
>
> "Simply enter the 12 digit UPC the particular product; click REQUEST, and then wait for the display of the list of Web locators (URLs) at which the desired product information can be found on the Internet."
>
> Alternatively, a bar code symbol scanner can be used to enter the UPSN (e.g. UPC or USC number) into the system, thereby avoiding manual keyboard entry operations.

It can be seen from this operation that it is not necessary to actually have the product in front of the individual in order to find information about the product. In fact, in column 19, lines 6-9, it is stated that a query is made to the user to determine if they are considering the purchase of a particular product or have purchased the particular product. All that is required is that the user have access to the UPN or UPC. What then occurs is that a return of a plurality of web locators (URLs) is returned to the user. Further, a scanner can be utilized to input the UPN into the system to avoid the manual keyboard entry operations. The display provided to the user is illustrated in Fig. 2A2. The system then prompts the user to select the URL from the displayed URL list. (Column 19, line 47.)

In the second search mode, the UPSN search mode, information can be entered in the form of a trademark or company name. The information resources "can include advertisements, specifications, operation descriptions, product simulations, product upgrade information, purchase information, maintenance information, warranty and service information, etc." (Column 19, lines 66-Column 20, line 3.) The portion of the specification referred to by the Examiner when discussing this aspect and in supporting the Examiner's contention that the "trademark symbol or logo or company name is printed on service or product with bar code" (Paragraph 4 of the March 31, 2006 Office Action) is supported in part, as set forth by the Examiner, by the language at column 20, lines 11-14 as noted herein above and as further reproduced again as follows:

> "Simply enter the trademark used in connection with the particular product and/or the company name of the product's manufacturer; click REQUEST, and then wait for the display of a list of Web locators (URLs) at which desired types of product information can be found on the Internet."

It can be seen that, although this refers to the use of a trademark as the input information, there is no indication anywhere in *Perkowski* that this trademark is disposed in close association or even on a document for the purpose of utilizing the system of *Perkowski*. Rather, there are two distinct and separate modes of operation that the user has available for the purpose of accessing information about a product. Again, to summarize those two modes, the first is where

it is for use in the event that the user has access to the UPC of a particular product. If so, the user can enter that UPC and receive information associated therewith. This, of course, is a function of what type of data is disposed in the relational database in association with this UPC. In the second mode of operation, a trademark or company name is entered and this is utilized to find information about the particular trademark or company. In the alternative embodiment discussed beginning at column 20, line 23, the two modes can be integrated into a single server application such that there is no need to select either one mode or the other. However, in this embodiment, one can enter either the UPC number or the trademark and the system will distinguish between the two. However, again, there is no indication that the user is accessing this from a brochure that has any relationship between a barcode and the trademark (indicia as set forth in the claim). Thus, there is no disclosure in *Perkowski* of a machine readable code and a visual indicia that together form a defined composite visual appearance, indicative of a relationship between the machine readable code and the presence of a location on a network that will use the routing system for connection to the remote location.

In response to the arguments set forth by Applicant's counsel in the various responses to the arguments that *Perkowski* does not teach applying a UPC label and a trademark or company name on a product, the Examiner has made the following remarks in paragraph 10 (A) as follows (March 31, 2006 Office Action, paragraph 10):

> 10. In the remarks, Applicant argued in substance that
>
> (A) Prior art does not teach the visual indicia on the product surface in a predetermine proximate visual orientation to the machine readable code.
>
> As to point (A), the visual indicia that Applicant claims is a logo 2504 (Applicant's specification page 50, lines 4-16). *Perkowski* teaches applying UPC label or bar code (machine readable code) to external packaging of products. *Perkowski* also teaches to combine the use of a UPC label, and company names or trademarks (visual indicia) to request product information. UPC label and trademark are inherently adjacent to each other on external packaging of products. Therefore, *Perkowski* inherently teaches the visual indicia on the product surface in a predetermined proximate visual orientation to the machine readable code (*Perkowski*, col. 4 lines 5-23; col. 10 line 14-col. 11 line 16; col. 15 lines 9-43; col. 20 line 9-14; col. 21 line 52-col. 22 line 19).

The Examiner again makes the statement that *Perkowski* "teaches to combine the use of UPC label, and company names or trademarks (visual indicia) to request product information." There is no disclosure in *Perkowski* for such a teaching nor is there any suggestion of such. The Examiner then states that *Perkowski* "inherently teaches the visual indicia on the product surface in a predetermined proximate visual orientation to the machine readable code." The Examiner's citations are the same citations that were noted herein above and, as described herein above, there is no such teaching or suggestion. In fact, since there are two modes of operation, there is no indication where the trademark information is received or from what source the trademark name is derived. With respect to the product code, it is not indicative that it does come from a product as there is a statement at column 19, line 6 that queries the user with "have you purchased a particular product or are you considering the purchase of a particular product, on which you would like current, up-to-date information from the manufacturer or advertiser?" (Column 19, line 6-9.) Thus, whether the user receives the information from a product or not has no bearing on whether there was a trademark or any indicia on the surface of the product. *Perkowski* is just silent as to this point. It is not necessary to have any indicia proximate to the system to enable or to facilitate use of the system, i.e., there is no reason to have such as the purpose is merely to retrieve information requiring a UPN that the user may have or a trademark that the user may have and wishes information about. Further, when the user has a UPN, there is no indication that the UPN is actually within a database and, as such, there is no support for the Examiner's position that *Perkowski* discloses visual indicia that, together with the machine readable code, define a composite visual appearance "indicative of a relationship between said machine readable code and the presence of the location on the network that will use a routing system for connection to the remote location and that such location on the network can be accessed by a computer having an appropriate input device" (March 31, 2006 Office Action, paragraph 4). There is no reason set forth by the Examiner why such combination is "inherent" in *Perkowski*, as *Perkowski* does not require such to operate, does not disclose such nor does it suggest any reason that the proximity of a particular indicia with a UPC would be helpful. The reason for this is that *Perkowski* does not require such and, in fact, it depends upon the user desiring new information about some product or company that the user is not even sure is in the database. Applicant's claimed invention sets fort that there is a relationship between the

machine readable code and the presence of a location on the network that will use a routing system for connection to the remote location. It is this association of the machine readable code with a location on the network indicated by the visual indicia that provides the user level of confidence that scanning of that code will result in information being retrieved.

The Examiner also states in paragraph 4 of the March 31, 2006 Office Action that *Perkowski* also discloses the step of "reading said machine readable code, such that reading of said machine readable code by a said input device will cause the routing system to connect the computer to the remote location. . . " citing *Perkowski* at column 10, line 14 - column 11, line 16 and column 15, lines 5-43. Column 10, line 14 - column 11, line 16 provide for reading the bar code symbols with a scanner and providing a visual display to the user. In column 10, line 33, the database structure is disclosed which is illustrated in Fig. 2B and 2A1. This is merely a database showing the relationship between a particular UPC and various URLs. However, there is no indication that reading of a machine readable code will "cause a routing system to connect the computer to the remote location" as set forth by the Examiner. In fact, all that occurs is the generation of a display to the user as illustrated in Fig. 2A2. *Perkowski* states at column 15, lines 31-35 that "then, in response to a URL selection query based on the contents of the information subfields shown in FIG. 2A2 and displayed on the screen of the client system C_a the Client System requests the IPSI Server identified by the user selected URL_i, to provide the provide the product or service information." As such, it can be seen that what is provided to the user is access to the user database and the user must then select a URL. Therefore, scanning of the code cannot cause computer based access to the network; rather, it is user selection that causes such. Therefore, the Examiner has no support for the contention that reading the machine readable code causes connection of the computer to the remote location. This is also the case with respect to the UPSN search mode described at column 15, beginning at line 10 wherein a trademark or service mark is entered. Again, this is a user selectable URL operation that is required prior to connecting to a remote location.

The Examiner indicates that *Perkowski* does not "explicitly teach the visual indicia associated with the routing system and indicates that scanning of the machine code will cause computer based access of the network." (Paragraph 4 of Final Office Action dated March 31,

2006.) The Examiner is utilizing the *Wilz* reference for support of this aspect of Applicant's invention, wherein the Examiner relies on a combination of *Perkowski* and *Wilz* to teach "visual indicia on the same surface of the bar code or machine readable code to indicate that by scanning of the machine readable code will cause computer based access of a network because it would indicate to user the URL that contains additional information" (Paragraph 4, Final Office Action, March 31, 2006). However, the Applicants pointed out in Applicants' response dated December 3, 2004 (dealing with substantially the identical statement) that the Examiner is combining a reference, the *Wilz* reference, in order to teach or suggest that the visual indicia is associated with the routing system and would indicate that scanning of the machine readable code will cause computer based access of a network. The *Wilz* reference is a reference that is directed toward providing a bar code of an unspecified length that has embedded therein the URL of a particular destination. Written below the bar code is the actual "domain name" associated with that URL (Fig. 1D1) which corresponds directly to the information in the bar code; i.e., they are identical.. Regardless of what is actually encoded within the bar code, the contents of that bar code are indicated therebelow. However, the Examiner is providing the *Wilz* reference to support the bar code that is *unique to the destination* and not to the product. The visual indicia in *Wilz*, the URL, does not indicate that a bar code that is related with a product and not with any routing information on the system is indicative of the information in that bar code, i.e., the address. As pointed out in the response (dated December 3, 2004), Applicant's present inventive concept provides a visual indicia that is indicative of a scanning operation but not of any particular address or location that will then indicate that a bar code that is related to the product and not to a destination can be scanned, and that scanning operation will route it to a destination, which destination is not associated with the bar code.

Applicants believe that the Examiner's combination of *Wilz* and *Perkowski* as an obviating combination is conclusory, as the problem solved by *Wilz* is to have the web indicia embedded within the bar code and in proximity thereto, i.e., the user can scan it or type in the ASCII characters, wherein the information in "both" the bar code and the ASCII code (URL) are identical. Applicant's claimed invention provides a non-indicative symbol or bar code as to location that allows an individual to access a broader range of locations than could be provided

on the face of the document. Further, without scanning the code, the user could not access information embedded in the code and, even if they could access that information (the bar code widths provide such visual information), that information is "not" routing information but, rather, product information. In *Wilz*, they can read the URL (ASCII code disposed beneath the bar code) and merely type that in instead of scanning the barcode. The scanning is just merely a way to facilitate input of the URL, as opposed to providing a means by which a third party can provide a service to allow access to a non-descript bar code for routing, the purpose of which bar code is other than routing and which bar code relates to the product and not to routing, and the indicia relate to routing and net to the manufacturer or the product.

Additionally, Applicants' submit that the limitation argued by Applicants is found within the language of Claim 1. Claim 1 is copied hereinbelow:

> A visual indicia for facilitating computer based access of a network by a consumer, comprising:
>
> a machine readable code disposed on a surface of a product and having encoded therein information related to the product, which product is provided by the product manufacturer, and which machine readable code is physically associated with the product itself, which machine readable code has no routing information contained therein to allow a user to access any location on a network, and which machine readable code has a relationship to the product or service unrelated to routing information;
>
> *the machine readable code being a part of a relational database that associates the machine readable code with a defined location on the network* and the relational database associated with a routing system that facilitates connection to the remote location on the network; and
>
> *a visual indicia having no apparent relationship to the machine readable code or to the defined location* disposed on said surface in a predetermined proximate visual orientation to said machine readable code and the visual indicia associated only with the routing system and not with the product manufacturer, such that the machine readable code and the visual indicia together form a defined composite visual appearance, indicative of a relationship between said machine readable code and the presence of a location on a network that will use the routing system for connection to the remote location and that such location on the network can be accessed by a computer having an appropriate input device for

> reading said machine readable code, such that reading of said machine readable code by said input device will cause the routing system to connect the computer to the remote location, and wherein the visual indicia indicates only that scanning of the machine readable code will cause computer based access of the network by the routing system. [emphasis added]

As is illustrated in the quoted selection above, the present inventive concept claims that the visual indicia has no apparent relationship to the defined location on the network. As stated above, the *Wilz* reference discloses a URL of a particular destination embedded within the bar code wherein the URL's actual domain name is also written below the bar code, i.e., "both" are related.. Thus, *Wilz* discloses a visual indicia and bar code which both have a specific defined relationship to the destination, not to the product.

2. Dependent Claim 2

Claim 2 depends from and further limits Claim 1 and is allowable for at least the same reasons as Claim 1 as discussed above. Additionally, Applicants' submit that *Wilz* does not disclose said visual indicia (the bar code in the Examiner's argument) is not machine readable. The Examiner states in paragraph 5 of the Office Action (dated March 31, 2006), that "*Wilz* teaches said visual indicia is not machine readable (col. 16 line 61 – col. 17 line 18)." The cited text, Column 16, line 61 – column 17, line 18, is copied herein below:

> As mentioned hereinabove, each URL-encoded bar code symbol of the present invention can be either a linear (1-D) or 2-D bar code symbol structure of virtually any symbology that allows for the encoding of the (ASCII-type) information contained within a URL-type information structure, the syntax of which is well known in the art. In the preferred embodiment, the URL-encoded symbol 8 is realized as a truncated-type bar code symbol constructed using any one of the following bar code symbologies: Code 128; full ASCII character set of Code 39; and code 93. Preferably, each such bar code symbol is printed above below or alongside each Web-site URL 14 or its listing in a Web-site guide or directory 13. Method and apparatus for composing and printing such bar code symbol lists and menus will be described in greater detail hereinafter. While the URL-encoded bar code symbol can be of any length, practical considerations will typically dictate

> which encoding technique should be used in any particular application. Notably, the advantage of using the truncated bar code symbol structure is that the height of the bars and spaces is relatively short in relation to the length of the bar code, thus allowing the URL-encoded truncated symbol 8 to be easily printed adjacent to each Web-site listing appearing on crowded pages of Web-site guides and catalogues, as illustrated in FIG. 1A.

The *Wilz* reference discloses an alphanumeric caption that is encoded within the barcode. In the cited paragraphs, the *Wilz* reference discloses that this alphanumeric code is comprised of bar code symbologies; Code 128; full ASCII character set of Code 39; and Code 93. These barcode symbologies are, by definition, machine readable symbols comprising encoded bars with ASCII text. Futhermore, *Wilz* additionally discloses that the alphanumeric strings, such as for the URL for a web-site adjacent to the bar code, are machine readable through an embodied optical scanner. (Col 20, lines 36 – 54). Thus, Applicants' respectfully submit that *Wilz* specifically teaches that symbols and text are machine readable.

3. Dependent Claims 3-9

The remaining Claims 3-9 depend from and further limit Claim 1 and are allowable for at least the same reason as the claim from which they depend as discussed above.

IX. Conclusion

A. Examiner's Position on the Combination of References:

The Examiner has stated the following in the March 31, 2006 Office Action, paragraph 4 (last paragraph herein enclosed):

> It would have been obvious to one of ordinary skill in the Data Processing art at the time of the invention to combine the teachings of *Perkowski* and *Wilz* to provide a visual indicia on the same surface as the bar code or machine readable code to indicate that by scanning of the machine readable code will cause the computer based access of the network because it would indicate to users the URL that contains additional information.

The Examiner's position is, in Applicant's opinion, conclusory, as the Examiner states that the combination of *Perkowski* and *Wilz* would provide the visual indicia on the same surface as the barcode "to indicate that by scanning of the machine readable code will cause computer based access of the network because it would indicate to user's the URL that contains additional information." The Examiner has provided no articulated reasoning why this barcode would indicate to users that the URL contains additional information. In *Wilz*, the barcode contains exactly the information in the visual indicia, (the ASCII code in *Wilz*).

B. Teaching-Suggestion-Motivation:

Although the recent *KSR* Supreme Court case has indicated that the teaching-suggestion-motivation (TSM) test is not a rigid test, it is still considered to be a factor. Under this test, there must be some type of teaching in each of the references for combination as well as some kind of suggestion. There also must be some motivation to combine the two references. If this test alone were utilized, the question would be whether there is any teaching in *Perkowski* and *Wilz* that would suggest to one skilled in the art to combine the two references or is there any motivation to so combine. The *Perkowski* reference is a reference that facilitates access to information. It facilitates this access in two ways. The first way is for the user to input a barcode or UPC from some type of document, brochure or the such into a webpage for the purpose of acquiring some type of information associated therewith. When the user has this barcode or UPC, there is no predisposition that there will be any information in the database. In this particular example, there is no visual indicia associated with that particular barcode or no suggestion or teaching in *Perkowski* that a brochure would be created with a visual indicia disposed thereon for the purpose of indicating to the user that there was some type of relationship between the information in the barcode and some location on the network. *Wilz*, on the other hand, provides a barcode that has contained therein a URL. The URL is written beneath the barcode in ASCII characters. Thus, the user can view the barcode on a document and immediately obtain a visual indicia that there is a URL denoted. One skilled in the art would recognize that barcodes with something under it might indicate that the information below the barcode was what is contained in the barcode. This would be consistent with situations where barcodes have numbers written thereunder as product codes. Thus, what will be provided to the

viewer would be an indication that scanning the barcode or typing in the URL would access some information associated with that URL and possibly even the brochure or document that the barcode were disposed on. However, there is no teaching in *Wilz* that would indicate that the barcode would have encoded therein information related to the product and which machine readable code has no routing information contained therein to allow a user to access a location on the network. In fact, that is exactly what information the bar code of *Wilz* has disposed therein-routing information. Further, this machine readable code does not have to have a relationship to the product or service that is unrelated to the routing information as the barcode information is the routing information. Further, there is no teaching as to why one would provide a visual indicia (the URL in *Wilz*) that would have no apparent relation to the machine readable code or to the defined location, as the barcode and visual indicia both are related, they are identical, and certainly have a relationship. Further, the visual indicia is associated only with the routing system and not with the product manufacturer, in accordance with the claims, whereas the *Wilz* system has a visual indicia that is associated with the bar code and, therefore, the routing. If the *Wilz* bar code were associated with the manufacturer, it would have to have a visual indicia that is also associated with the manufacturer and, thus, no routing information. If a product code is not associated with a manufacturer, in *Wilz* then the visual indicia cannot be associated with a product manufacturer. The claims require that the visual indicia not be associated with a product manufacturer whereas the machine readable code must be related to the product manufacturer, as the information therein is related to the product. Thus *Wilz* has no teaching therein for the type of relationship between the visual indicia and the code. There would thus be no reason or motivation or suggestion to combine *Wilz* with *Perkowski*. There is no reason for *Wilz* to enter information into the system of *Perkowski*, as the *Perkowski* system requires the code in order to determine the URL. Since the URL was already known in *Wilz*, the question is "Why would one skilled in the art want to enter a URL into a system which has the sole purpose of utilizing a code to obtain URLs?" As such, Applicant believes that there is no motivation or suggestion that would in any way lead one skilled in the art to combine such.

C. *KSR* Test:

The recent *KSR* case, although not fully analyzed as to its impact on obviousness type rejections under 35 U.S.C. § 103, seems to indicate that the test is that "if a person of ordinary skill can not implement a *predictable variation*, §103 likely bars it's patentability." (*KSR* at page 13.) The question would be whether *Perkowski* could be varied in a predictable manner under this dicta to utilize a barcode on a document that would have a visual indicia associated therewith, i.e., the trademark. Applicant believes there is no reason for the *Perkowski* barcode to have the visual indicia disposed thereon or in close proximity thereto, which visual indicia would be nothing more than a logo, and that the visual indicia is associated only with the routing system and not with the product manufacturer. The purpose of the composite visual appearance is to provide an indication of a relationship between the machine readable code and the presence of a location on a network that will use a routing system for connection to the remote location. Even if a trademark were disposed on the *Perkowski* document, there is no indication that the trademark is anything more than a trademark and, further, this certainly would not indicate to one skilled in the art that there was a relationship between the trademark (indicia) and storing information to a remote site containing product information associated with the barcode, especially if the barcode indicates product information. Therefore, there is no reason to utilize the *Wilz* barcode/URL combination for the *Perkowski* system, since the *Perkowski* system does not require such. To utilize such in *Perkowski* would provide no advantage to the user, as the user would either use a trademark or the barcode independently of each other (it being noted that these are independent systems in *Perkowski*). As such, there is no predictable variation of *Perkowski* that would lead one skilled in the art to utilize the *Wilz* barcode/URL. As such, when work is available in one field of endeavor, i.e., utilizing product codes or trademarks to access a list of URLs on the web, there is no design incentive or other market force that would prompt a variation (a predictable variation) of the *Perkowski* reference to utilize a barcode for a purpose that is not useful or envisioned in *Perkowski*. In summary, Applicant submits that the Examiner has failed to provide a *prima facie* case as to why the *Perkowski* and *Wilz* references, in combination, obviate Applicant's present inventive concept, as defined by claims 1-9.

Respectfully submitted,
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CLAIMS APPENDIX

1. A visual indicia for facilitating computer based access of a network by a consumer, comprising:

a machine readable code disposed on a surface of a product and having encoded therein information related to the product, which product is provided by the product manufacturer, and which machine readable code is physically associated with the product itself, which machine readable code has no routing information contained therein to allow a user to access any location on a network, and which machine readable code has a relationship to the product or service unrelated to routing information;

the machine readable code being a part of a relational database that associates the machine readable code with a defined location on the network and the relational database associated with a routing system that facilitates connection to the remote location on the network; and

a visual indicia having no apparent relationship to the machine readable code or to the defined location disposed on said surface in a predetermined proximate visual orientation to said machine readable code and the visual indicia associated only with the routing system and not with the product manufacturer, such that the machine readable code and the visual indicia together form a defined composite visual appearance, indicative of a relationship between said machine readable code and the presence of a location on a network that will use the routing system for connection to the remote location and that such location on the network can be accessed by a computer having an appropriate input device for reading said machine readable code, such that reading of said machine readable code by said input device will cause the routing system to connect the computer to the remote location, and wherein the visual indicia indicates only that scanning of the machine readable code will cause computer based access of the network by the routing system.

2. The indicia of Claim 1, wherein said visual indicia is not machine readable.

3. The indicia of Claim 1, wherein said machine readable code represents a product.

4. The indicia of Claim 3, wherein said machine readable code is disposed directly on a product.

5. The indicia of Claim 3, wherein said machine readable code is disposed in close association with said product.

6. The indicia of Claim 3, wherein said machine readable code is a UPN.

7. The indicia of Claim 3, wherein the machine readable code is an ISBN.

8. The indicia of Claim 3, wherein the machine readable code is an EAN.

9. The indicia of Claim 1, wherein the input device for reading said machine readable code is a scanner.

EVIDENCE APPENDIX

U.S. Patent No. 6,064,979 to Perkowski ("Perkowski") found in paragraph 4-8 and 10-11 of First Office Action (dated March 12, 2002, paragraphs 3-7 and 9-11 of Final Office Action (dated November 26, 2002), paragraphs 2-9, 11 and 12 of Third Office Action (dated August 7, 2003), paragraphs 5-10 of Final Office Action (dated January 30, 2004), paragraphs 4, 5 and 8-10 of the Fifth Office Action (dated September 3, 2004), paragraphs 3, 4, and 6-10 of Final Office Action (dated April 27, 2005), and paragraphs 3, 4, and 6-10 of Final Office Action (dated March 31, 2006.

U.S. Patent No. 6,394,354 to Wilz, Sr. et al. ("Wilz") found in paragraph 4-6, and 8 of Fifth Office Action (dated September 3, 2004), paragraphs 3-5, and 7 of Final Office Action (dated April 27, 2005) and paragraphs 3-5, and 7 of Final Office Action (dated March 31, 2006).

KSR International Co. v. Teleflex Inc., et al., 550 U.S. ___ (2007)

US006064979A

United States Patent [19]

Perkowski

[11] Patent Number: 6,064,979

[45] Date of Patent: *May 16, 2000

[54] **METHOD OF AND SYSTEM FOR FINDING AND SERVING CONSUMER PRODUCT RELATED INFORMATION OVER THE INTERNET USING MANUFACTURER IDENTIFICATION NUMBERS**

[75] Inventor: **Thomas J. Perkowski**, Darien, Conn.

[73] Assignee: **IPF, Inc.**, Darien, Conn.

[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **08/752,136**

[22] Filed: **Nov. 19, 1996**

Related U.S. Application Data

[63] Continuation-in-part of application No. 08/736,798, Oct. 25, 1996, Pat. No. 5,918,214.

[51] **Int. Cl.**[7] **G06F 17/60**

[52] **U.S. Cl.** **705/26**; 235/375; 378/93.12; 709/219; 705/27

[58] **Field of Search** 705/1, 14, 16, 705/21, 22, 24, 26, 27; 707/1, 2, 3, 4, 10, 101, 104, 501, 513; 395/200.3, 200.31, 200.33, 200.47, 200.48, 200.49; 235/375, 376, 462; 329/93.12; 709/219

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WO 98/06055	2/1998	WIPO	G06F 63/00
WO 98/09243	3/1998	WIPO	G06F 19/00
WO 98/20411	5/1998	WIPO	G06F 3/00

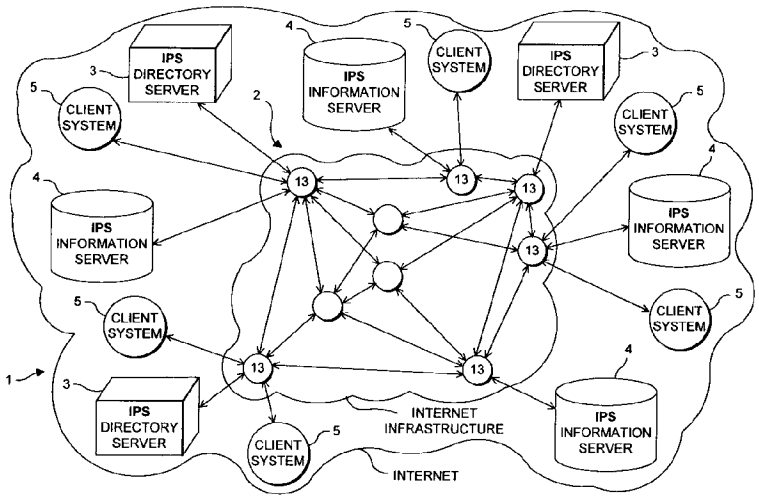
Primary Examiner—Stephens R. Tkacs

Attorney, Agent, or Firm—Thomas J. Perkowski, Esq., P.C.

[57] **ABSTRACT**

A method of and system for finding and serving consumer product-related information on the Internet comprising a database serving subsystem which stores: a plurality of manufacturer identification numbers (MINs) assigned to a plurality of manufacturers of consumer products; a plurality of home-page specifying URLs symbolically linked to the plurality of MINs; a plurality of universal product numbers (UPN) assigned to a plurality of consumer products made by the plurality of manufacturers; and a plurality of product-information specifying URLs symbolically linked to the plurality of UPNs. During operation, a client subsystem transmits to the database serving subsystem, a request for information which includes the UPN assigned to the consumer product on which product-related information is being sought. The database serving subsystem automatically compares the UPN against the stored plurality of MINs, and automatically returns to the client subsystem, one or more of URLs symbolically linked to the UPN, if URLs have been symbolically linked to the UPN within the database serving subsystem. However, if no URLs have been symbolically linked to the UPN, then the database serving subsystem automatically returns the home-page specifying URL symbolically linked to the MIN contained within the UPN in the request. By virtue of this novel MIN-based search mechanism embodied within the database serving subsystem, client subsystems are automatically provided with the home-page of the manufacturer's World Wide Web (WWW) site in situations where product-information specifying URLs have not yet been symbolically linked with the UPN on any one of the manufacturer's products.

27 Claims, 12 Drawing Sheets



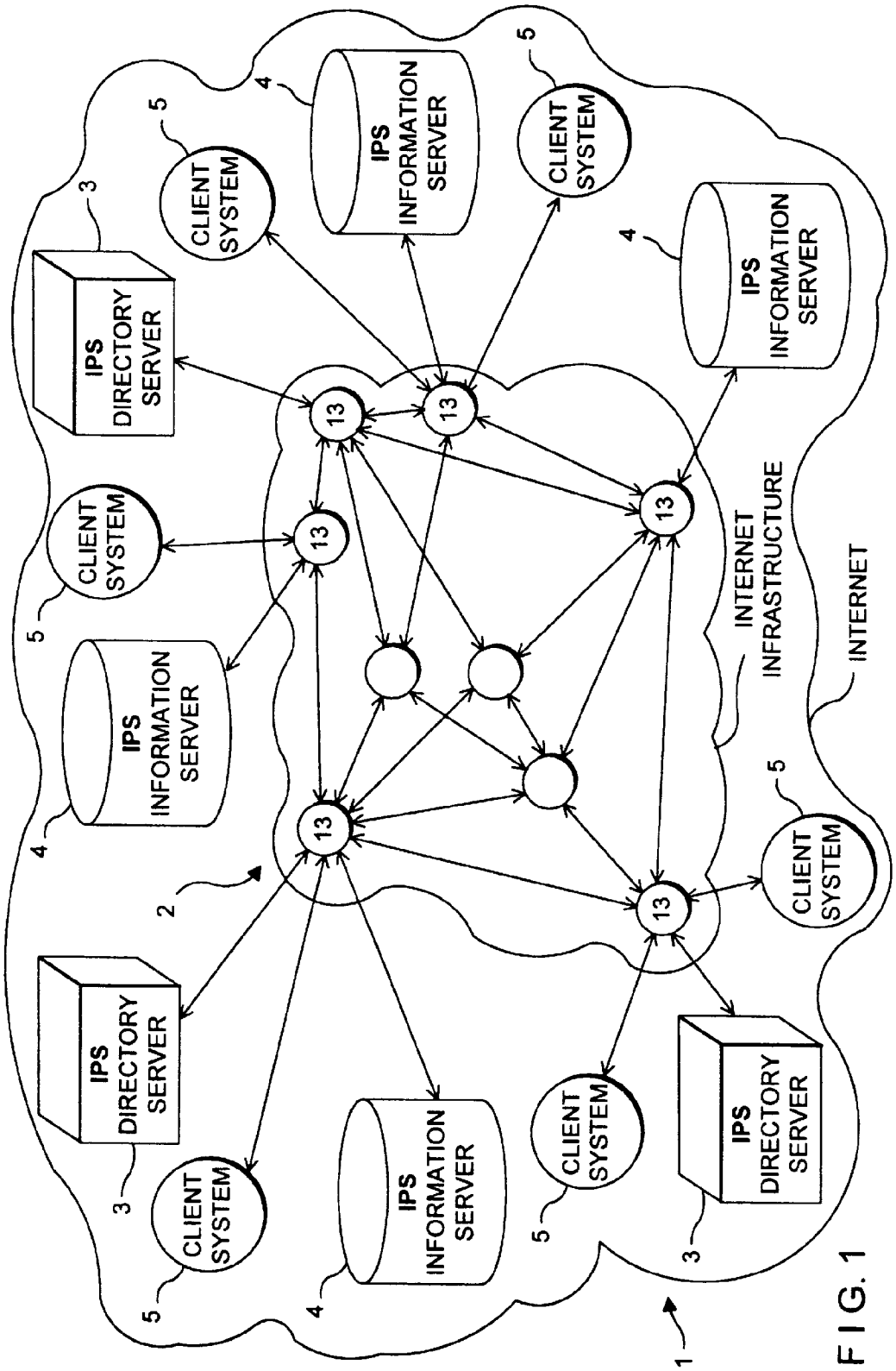

IPS DIRECTORY SERVER
IPS INFORMATION SERVER
CLIENT SYSTEM
INTERNET INFRASTRUCTURE
INTERNET
1
2
3
4
5
13

FIG. 1

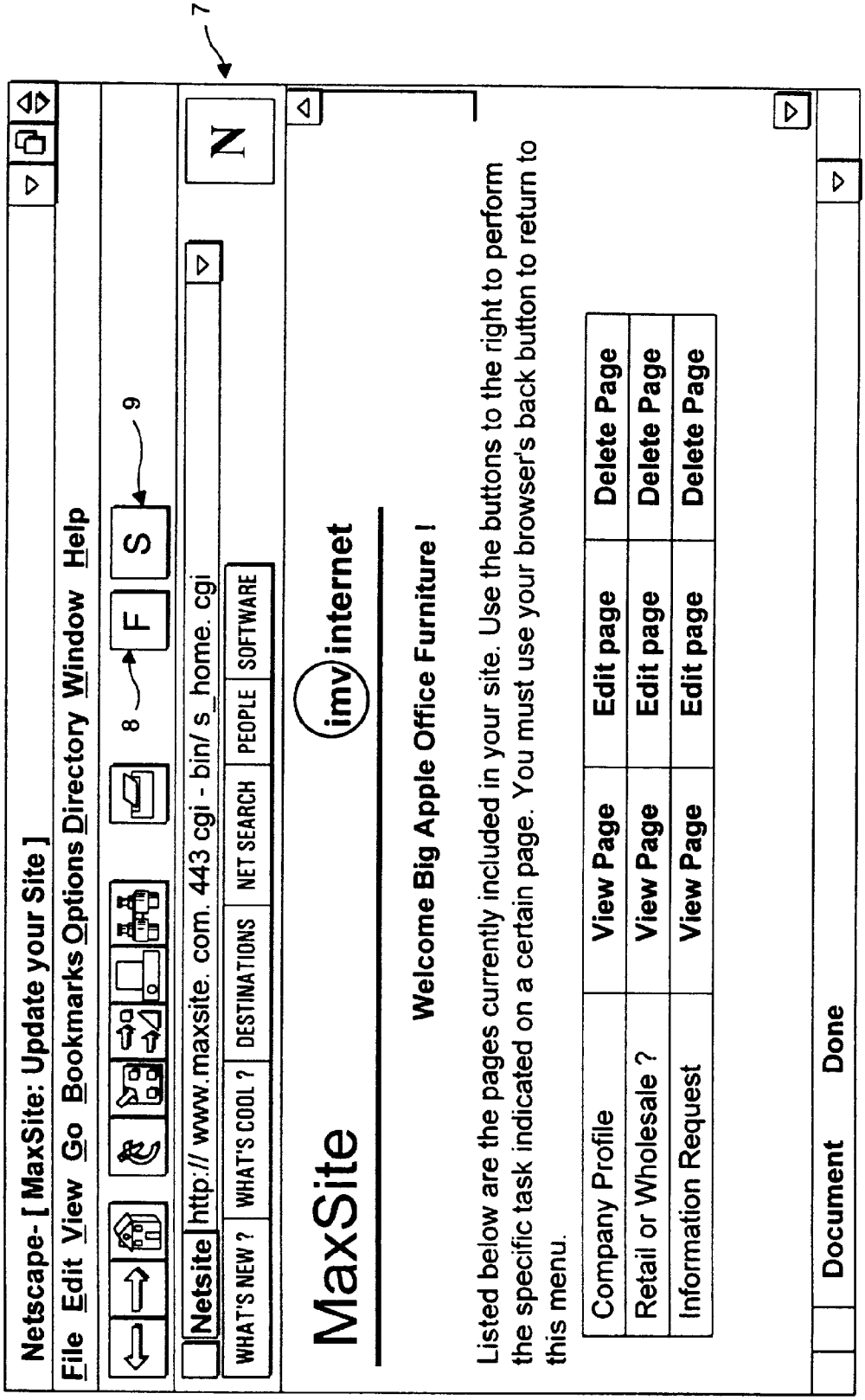

Netscape- [MaxSite: Update your Site]
File Edit View Go Bookmarks Options Directory Window Help
Netsite http:// www.maxsite. com. 443 cgi - bin/ s_home. cgi
WHAT'S NEW ? WHAT'S COOL ? DESTINATIONS NET SEARCH PEOPLE SOFTWARE
MaxSite
imv internet
Welcome Big Apple Office Furniture !
Listed below are the pages currently included in your site. Use the buttons to the right to perform the specific task indicated on a certain page. You must use your browser's back button to return to this menu.
Company Profile View Page Edit page Delete Page
Retail or Wholesale ? View Page Edit page Delete Page
Information Request View Page Edit page Delete Page
Document Done
7
8
9

FIG. 1A

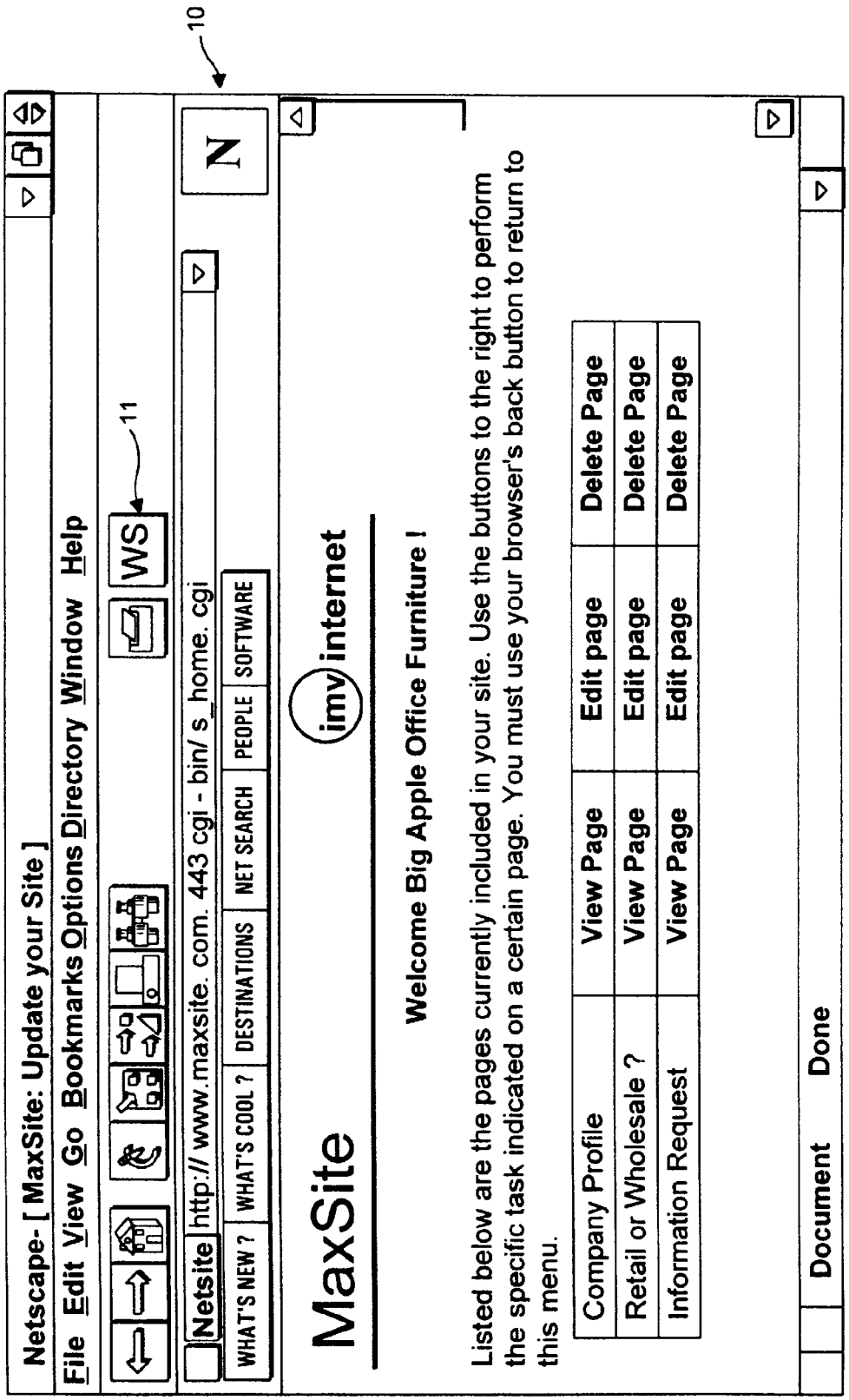

10
11
Netscape- [MaxSite: Update your Site]
File Edit View Go Bookmarks Options Directory Window Help
WS
Netsite http:// www.maxsite. com. 443 cgi - bin/ s_home. cgi
WHAT'S NEW ? WHAT'S COOL ? DESTINATIONS NET SEARCH PEOPLE SOFTWARE
MaxSite
imv internet
Welcome Big Apple Office Furniture !
Listed below are the pages currently included in your site. Use the buttons to the right to perform the specific task indicated on a certain page. You must use your browser's back button to return to this menu.
Company Profile View Page Edit page Delete Page
Retail or Wholesale ? View Page Edit page Delete Page
Information Request View Page Edit page Delete Page
Document Done

FIG. 1B

IP/SN	REGISTRANT'S NAME	PRODUCT DESCRIPTION	UNIFORM RESOURCE LOCATOR (URL)	TRADE/ SERVICE MARKS	e-mail Address	Status
7/18908/17674/0	APPLE COMPUTER, INC. CUPERTINO, CALIF.	POWER MAC. 7600/120 PERSONAL COMPUTER	http://www.power./pc	POWER MAC.		
0/373/100/6	PROCTOR & GAMBLE	TOOTH PASTE	http://www.tooth.p./pc	CREST		
3/12547/68404/0	WARNER WELCOME	ACID REDUCER	http://www.zantac./pc	ZANTAC, ZANTAC 75		
0/00005/17643/4	KODAK, INC.	FILM PROCESSING	http://www.kodak./pc	KODAK		
⋮	⋮	⋮	⋮	⋮	⋮	⋮
0/27242/51057/9	SONY, INC.	PERSONAL COMPUTER	http://www.sony.com./pc	SONY		

FIG. 2A1

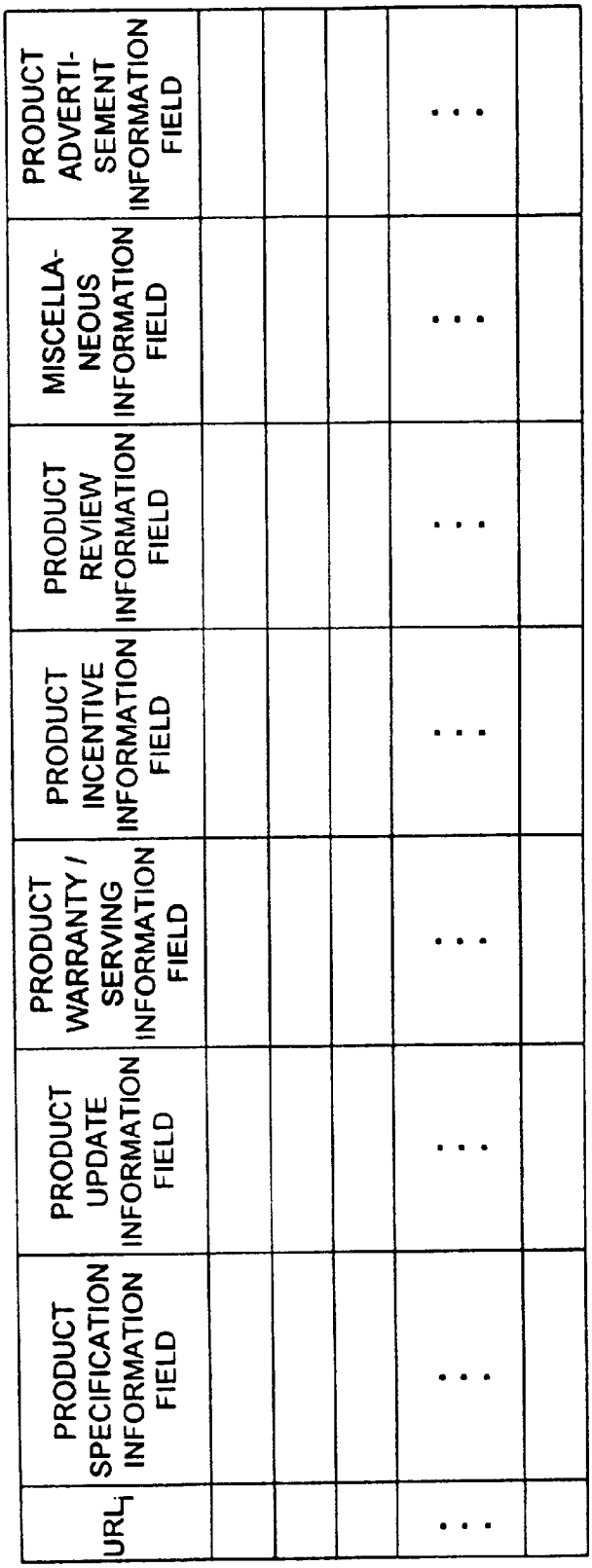
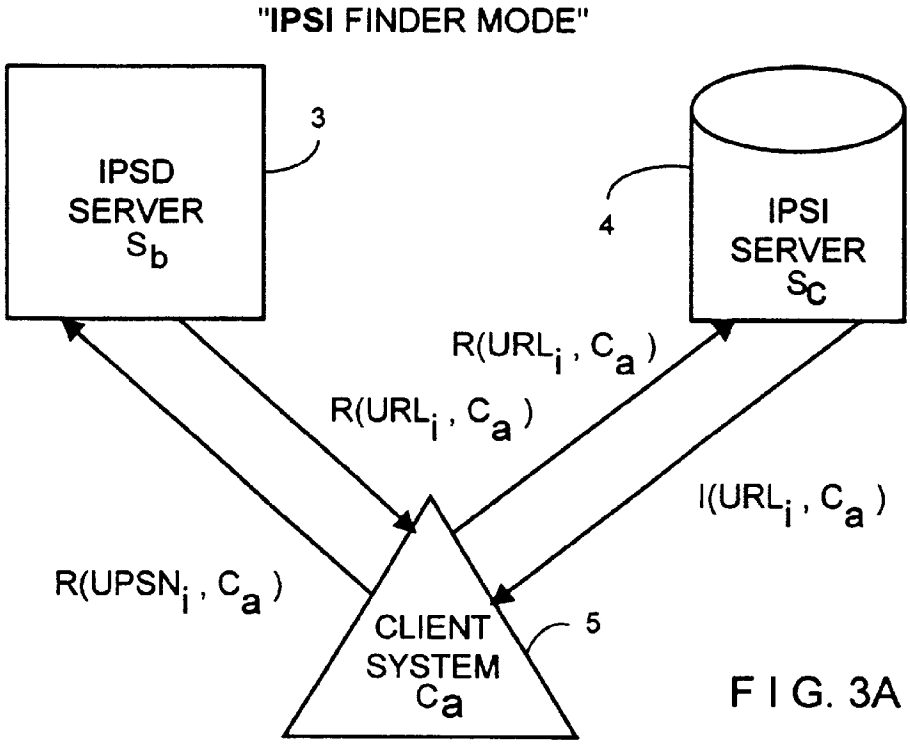

URL
PRODUCT SPECIFICATION INFORMATION FIELD
PRODUCT UPDATE INFORMATION FIELD
PRODUCT WARRANTY / SERVING INFORMATION FIELD
PRODUCT INCENTIVE INFORMATION FIELD
PRODUCT REVIEW INFORMATION FIELD
MISCELLA-NEOUS INFORMATION FIELD
PRODUCT ADVERTI-SEMENT INFORMATION FIELD

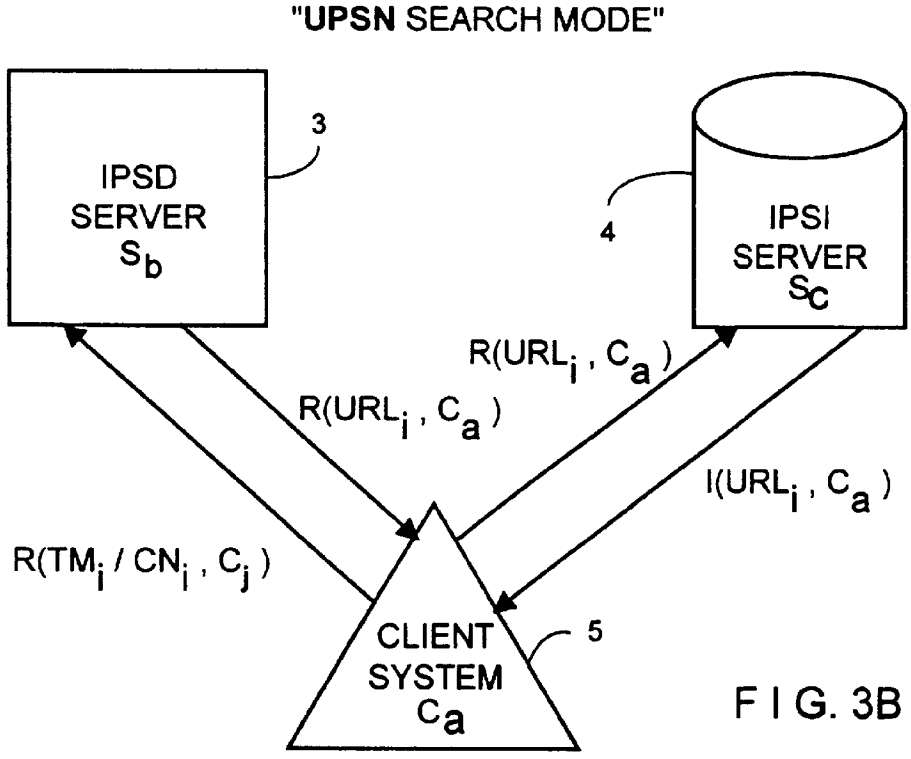
FIG. 2A2

IP / S N	REGISTRANT'S NAME	PRODUCT DESCRIPTION	TRADE/SERVICE MARKS	E-MAIL ADDRESS	STATUS
7/05089/37460/7	NETSCAPE COMMUNICATIONS CORP.	INTERNET NAVIGATOR	NETSCAPE, NAVIGATOR		
0/30000/01020/4	QUAKER, INC.	OATMEAL	QUAKER		
0/496/390/1	COLA COLA, INC.	COLA SODA	COCA - COLA, COKE		
0/7599/24245/2	WARNER BROS.	PAT METHANY AUDIO CD	GEFFEN		
. . .	. . .	. . .	. . .	. . .	. . .

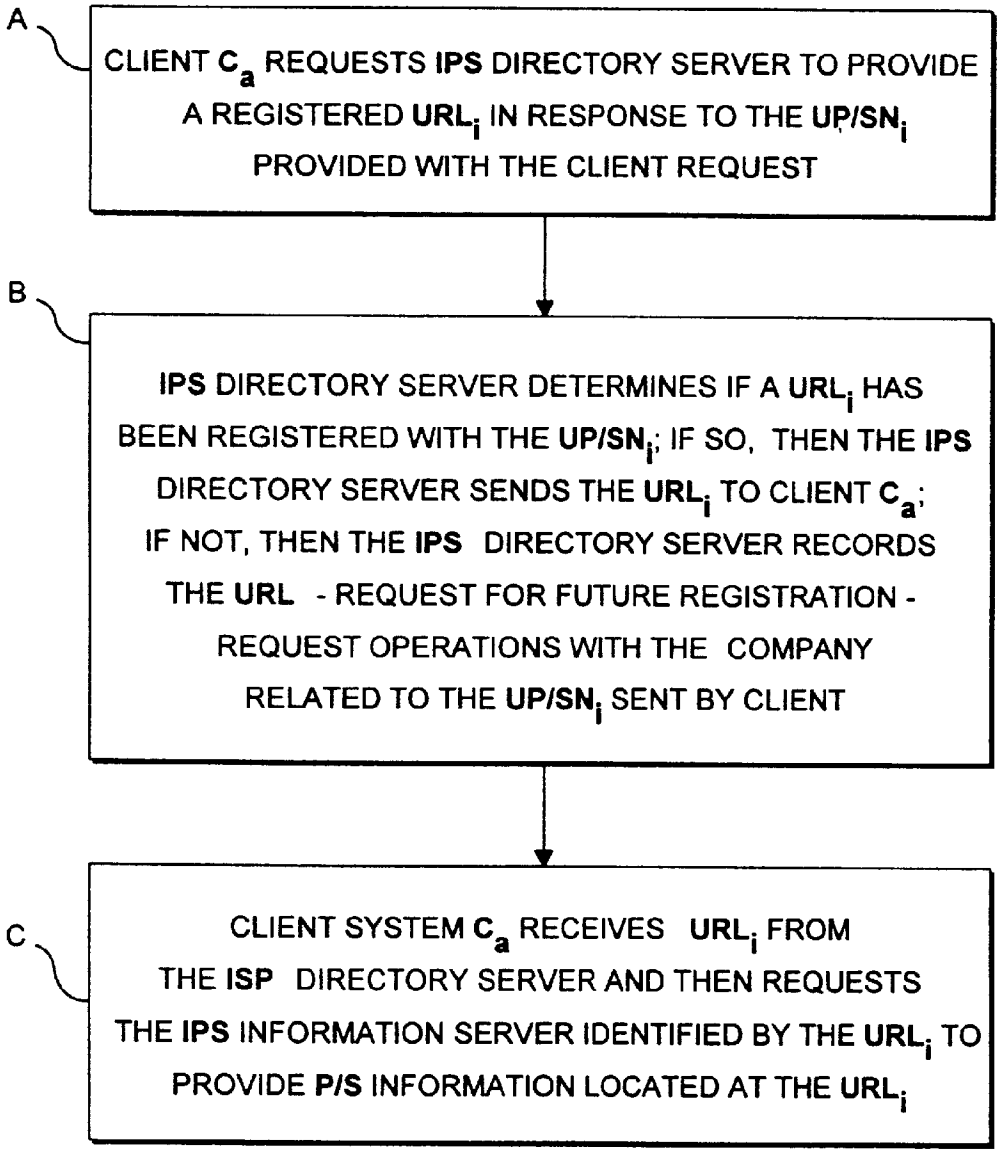
FIG. 2B


"IPSI FINDER MODE"
IPSD SERVER S_b
3
IPSI SERVER S_C
4
$R(URL_i, C_a)$
$R(URL_i, C_a)$
$I(URL_i, C_a)$
$R(UPSN_i, C_a)$
CLIENT SYSTEM C_a
5

F I G. 3A

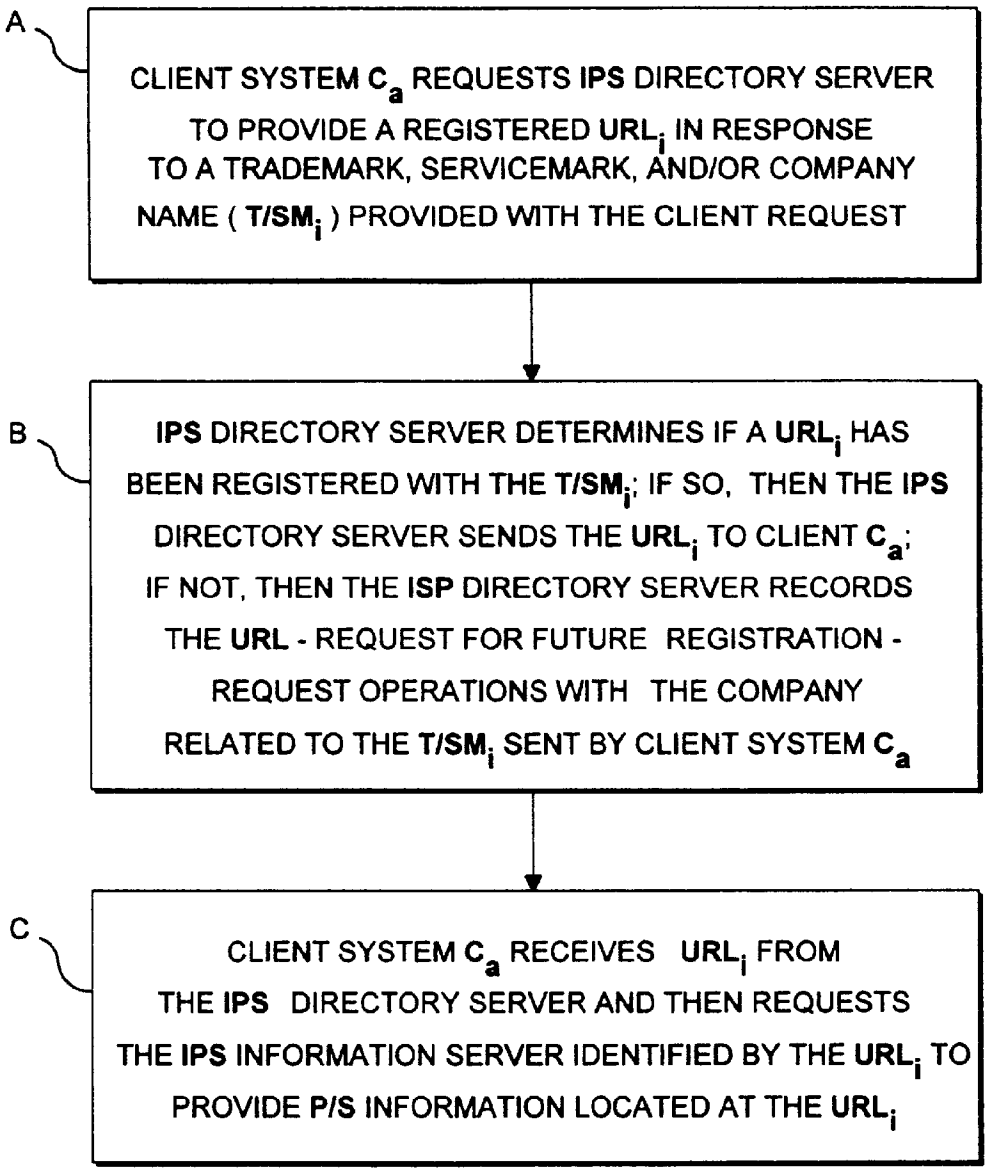

"UPSN SEARCH MODE"
IPSD SERVER S_b
3
IPSI SERVER S_C
4
$R(URL_i, C_a)$
$R(URL_i, C_a)$
$I(URL_i, C_a)$
$R(TM_i / CN_i, C_j)$
CLIENT SYSTEM C_a
5

F I G. 3B



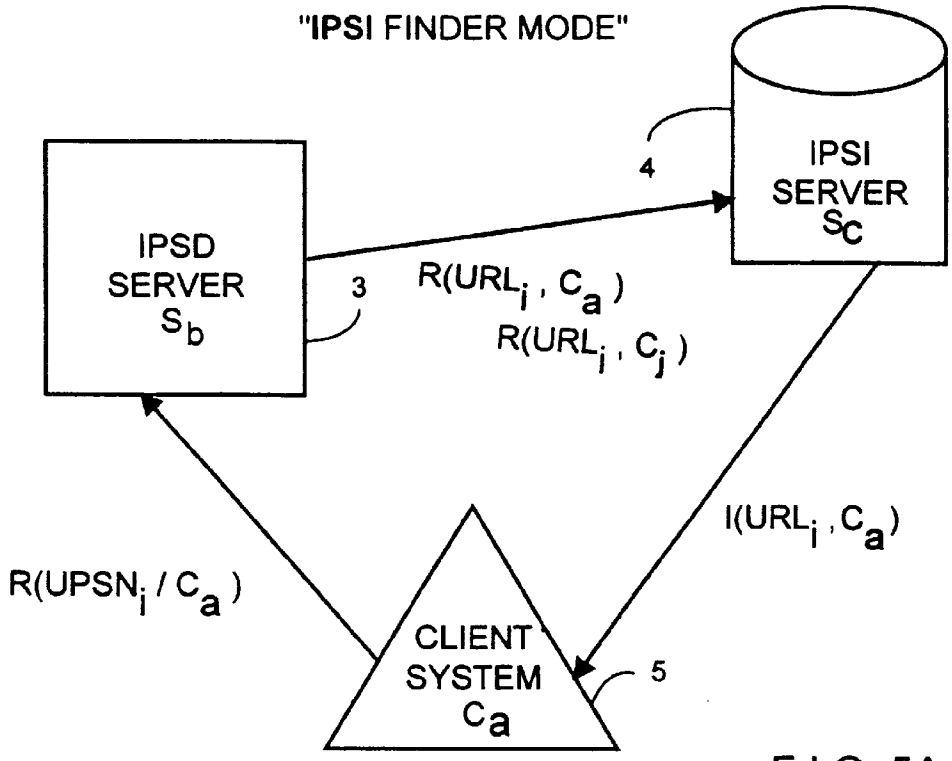
"IPSI FINDER MODE (FIG. 3A)"

FIG. 4A

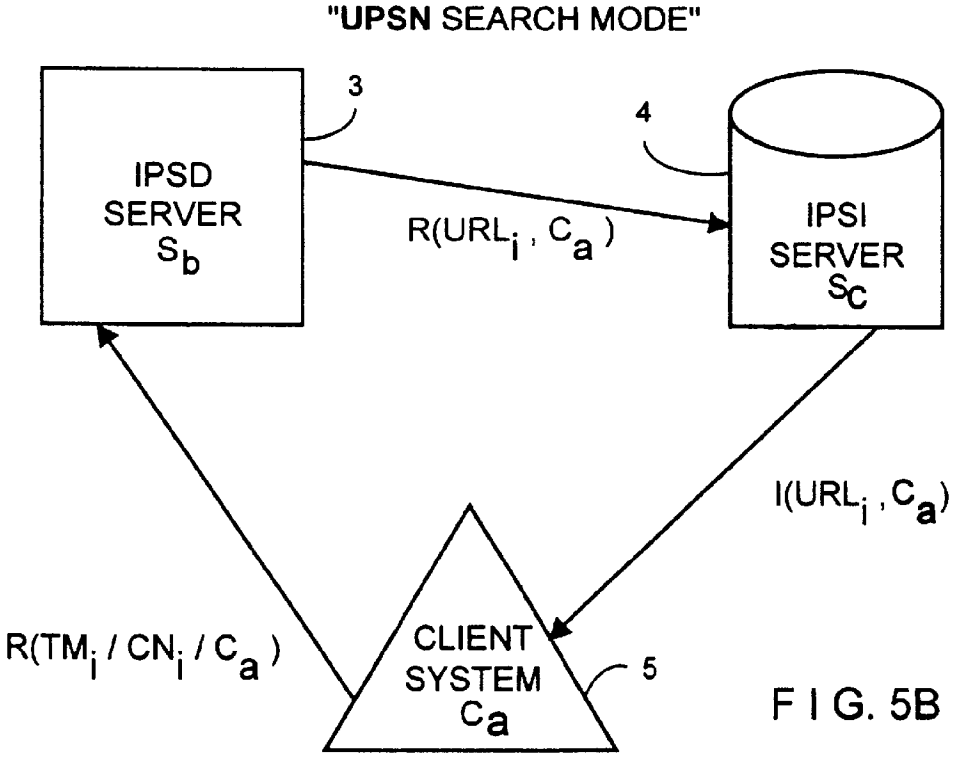


"UP/SN SEARCH MODE (FIG. 3B)"

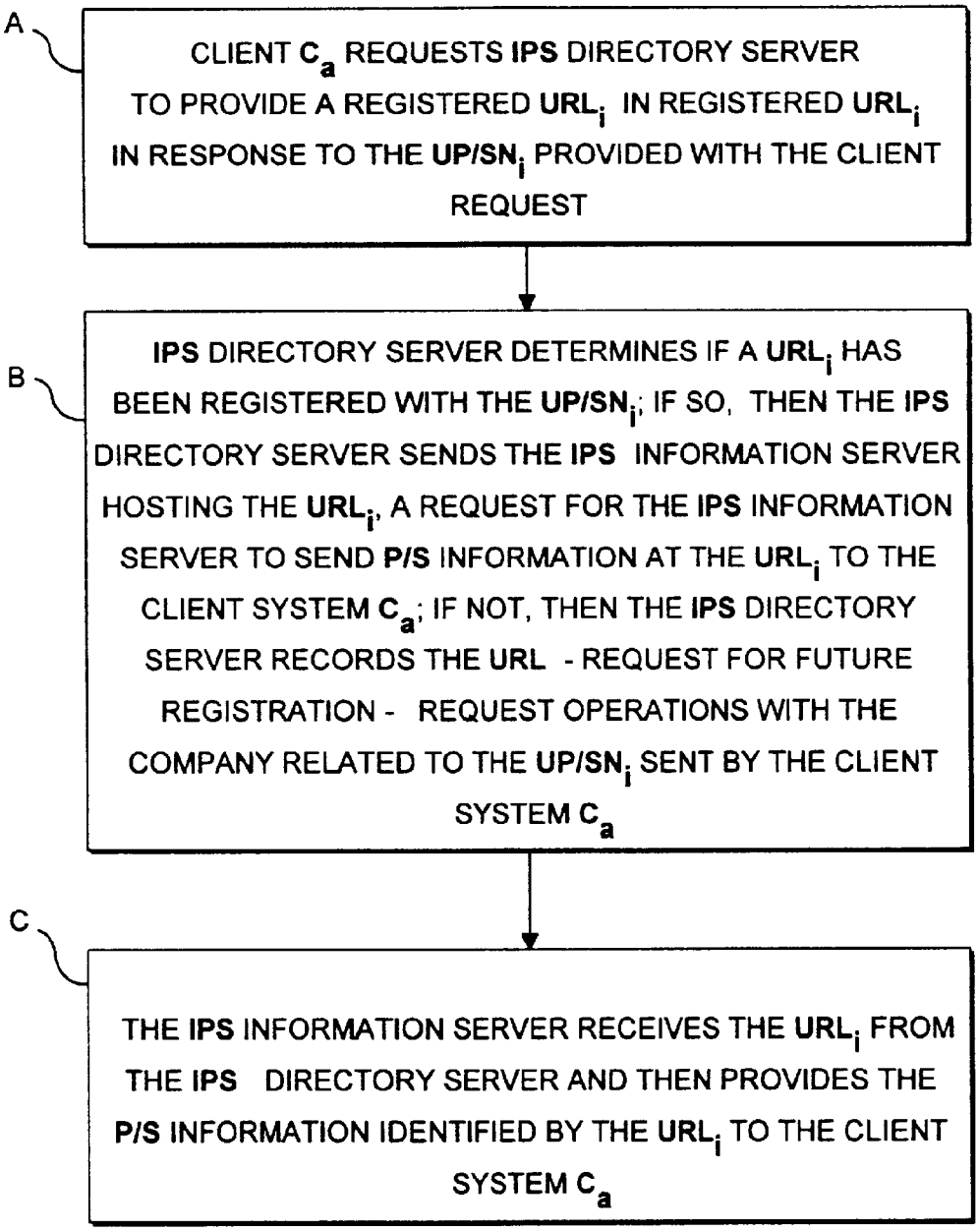
FIG. 4B


"IPSI FINDER MODE"
IPSI SERVER S_C
4
IPSD SERVER S_b
3
$R(URL_i, C_a)$
$R(URL_j, C_j)$
$I(URL_i, C_a)$
$R(UPSN_i / C_a)$
CLIENT SYSTEM C_a
5

F I G. 5A

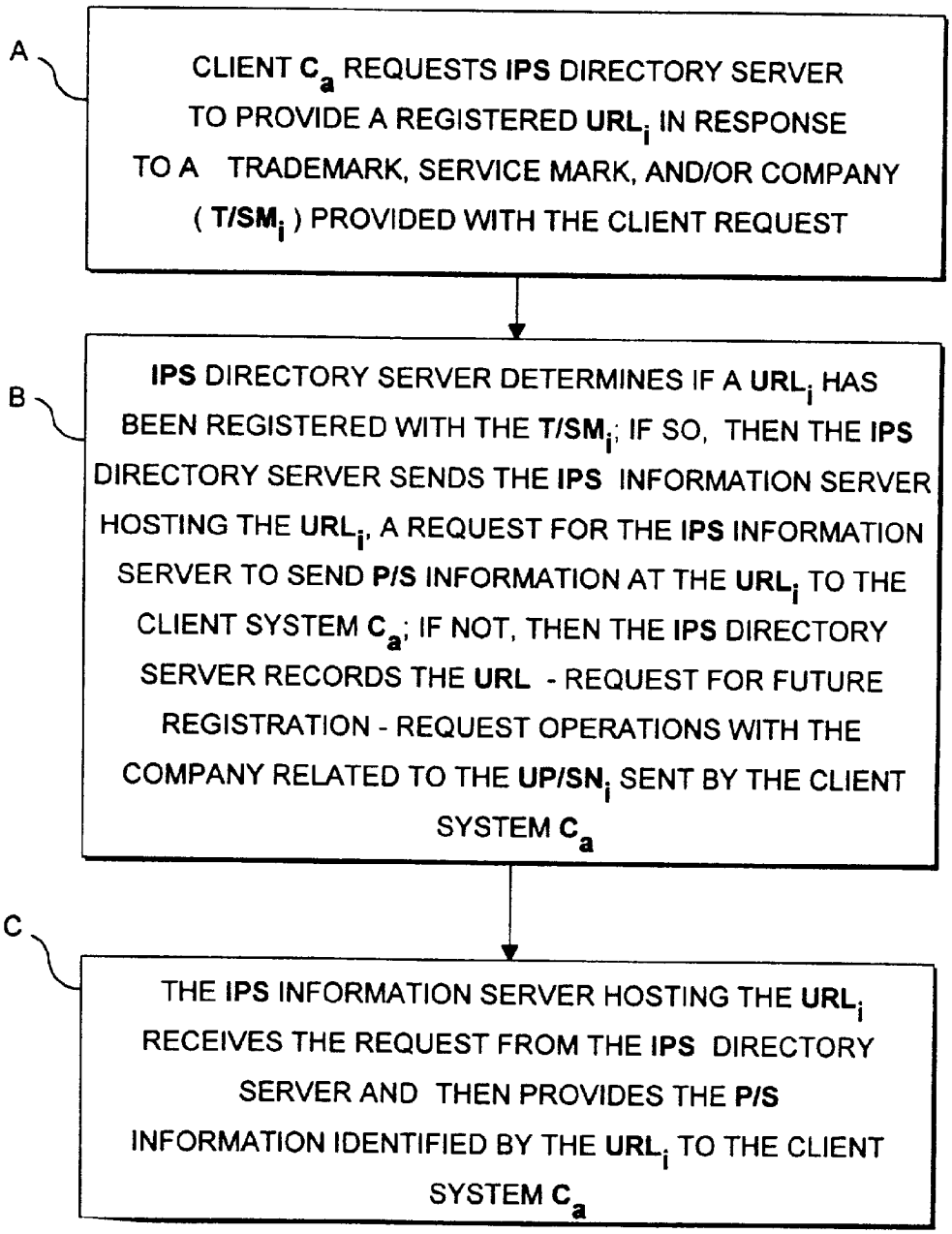

"UPSN SEARCH MODE"
3
IPSD SERVER S_b
4
IPSI SERVER S_C
$R(URL_i, C_a)$
$I(URL_i, C_a)$
$R(TM_i / CN_i / C_a)$
CLIENT SYSTEM C_a
5

F I G. 5B



"IPSI FINDER MODE (FIG. 5A)"

FIG. 6A



"UP/SN SEARCH MODE (FIG. 5B)"

FIG. 6B

METHOD OF AND SYSTEM FOR FINDING AND SERVING CONSUMER PRODUCT RELATED INFORMATION OVER THE INTERNET USING MANUFACTURER IDENTIFICATION NUMBERS

RELATED CASES

This is a Continuation-in-Part of application Ser. No. 08/736,798 entitled "System And Method For Finding Product And Service Related Information On The Internet" filed by Thomas J. Perkowski on Oct. 25, 1996, now U.S. Pat. No. 5,918,214, and incorporated herein by reference in its entirety.

BACKGROUND OF INVENTION

1. Field of Invention

The present invention relates to a system and method for finding product and service related information on the International Information Infrastructure (e.g. the Internet).

2. Brief Description of the Prior Art

Presently, an enormous amount of time, money and effort is being expended by companies in order to advertise and sell their products and services, and post-purchase product-related information, warranty service and the like. For decades, various types of media have been used to realize such fundamental business functions.

In recent times, there has been a number of significant developments in connection with the global information network called the "Internet", which has greatly influenced many companies to create multi-media Internet Web-sites in order to advertise, sell and maintain their products and services. Examples of such developments include, for example: the Hypertext Markup Language (HTML) based World Wide Web (WWW) by Tim Berners-Lee; user friendly GUI-based Internet navigation tools, such as the Netscape® browser from Netscape Communications, Inc., the Internet Explorer™ browser from MicroSoft Corporation and the Mosaic™ browser from Spyglass Corporation; and the Virtual Reality Modelling Language (VRML) by Mark Pesce. Such recent developments have made it very easy for businesses to create 2-D Hypermedia-based Home Pages and 3-D VR Worlds (i.e. 3-D Web-sites) for the purpose of projecting a desired "corporate image" and providing a backdrop for financial investment solicitation, product and service advertisement, sales and maintenance operations.

Presently, a person desiring to acquire information about any particular product has numerous of available search options. In particular, he or she may attempt to directly contact the manufacturer, wholesaler or reseller via telephone, US mail, e-mail, or the company's World Wide Web-site (WWW), if such a one exists. In order to acquire product information through the seller's WWW site, the inquirer must first determine the location of its WWW site (i.e. Internet address) which oftentimes can involve using Internet Search engines such as Yahoo®, AltaVista™, WebCrawler™, Lycos™, Excite™, or the like. This can be a very time consuming process and may lead to a dead end. Upon obtaining the Internet address one must then review the home page of the company's Web-site in order to find where, if at all, information about a particular product resides on the Website. This search process can be time consuming and therefore expensive (in terms of Internet time) and may not locate the desired information on the product of interest.

In some instances, product brochures bear a preprinted Internet address designed to direct or point prospective customers to a particular Web-site where more detailed product information can be found. A recent example of this "preprinted Web Address" pointing technique is the 1996 product brochure published by the Sony Corporation for its Sony® PCV-70 Personal Computer, which refers prospective customers to the Sony Web Address "http://www.sony.com/pc". While this approach provides a direct way of finding product and service related information on the Internet, it is not without its shortcomings and drawbacks.

In particular, when a company improves, changes or modifies an existing Web-site which publishes product and/or service advertisements and related information, it is difficult (if not impossible) not to change the Internet locations (i.e. Web addresses) at which such product and/or service advertisements and related information appear. Whenever a company decides or is forced to change any of its advertising, marketing and/or public relations firms, there is a substantial likelihood that new Web-sites will be created and launched for particular products and services, and that the Web addresses of such new Web-sites will no longer correspond with the Web addresses on preprinted product and service brochures in currently in circulation. This can result in pointing a consumer to erroneous or vacant Web-sites, which present either old or otherwise outdated product and/or service information, and thereby possibly adversely influencing the consumer's purchasing decision.

Moreover, when a company launches a new Web-site as part of a new advertising and marketing campaign for a particular product or service, any preprinted advertising or marketing material relating to such products and services will not reflect the new Web-site addresses which the campaign is promoting for consumer visitation. This fact about preprinted advertising media renders it difficult to unify new and old advertising media currently in circulation into thematically coherent advertising and marketing campaign. In short, the inherently static nature of the "preprinted Web address" pointing technique described above is wholly incapable of adjusting to the dynamic needs of advertising, marketing and public relations firms alike.

In addition to the above-described techniques, I-World by Mecklermedia has recently launched a commercial product finder database on the Internet called "Internet Shopper". Notably, the "Internet Shopper" database is organized by specific types of product categories covering computer and telecommunication related technologies. While this product information finding service may be helpful to potential consumers of computer or communication equipment, nevertheless it fails to provide an easy way to find information on previously purchased products, or on products outside of the field of communication or computer technology. Consequently, the value of this prior art technique is limited to those considering the purchase of products catalogued within the taxonomy of the "Internet Shopper" directory.

In view of the inherent limitations of I-World's "Internet Shopper" and other product finding directories on the Internet, such as "NetBuyer" by Computer Shopper (at "http://www.netbuyer.com"), the National Information Infrastructure Testbed (NIIT) organization has recently formed a "confidential committee of NIIT members" under the title "Universal Product and Service Code Project". The stated problem addressed by this Project is to determine how to locate specific goods and services on the Internet, and how to compare prices and other critical market information. As publicized in a NIIT Project Abstract, the "Universal

Product and Service Code Project seeks to make it easier to electronically locate goods and services on the Internet using universal product and service identifiers and locators. As stated in the Project Abstract, the "NIIT believes that changing the way in which Internet information is organized is fundamental to solving this problem. In the Universal Product and Service Code Project, NIIT members are currently exploring how coding structures can help organize information about products and services accessible using the Internet. NIIT's goal is to inform the development of formalized coding standards that can be used nationally and internationally so that users can locate goods and services through simple searching and browsing methods. In turn, more advanced features, such as comparison shopping, can be added as "intelligent agent" software programs are refined to enable users to search and retrieve products and services linked to these structures.

While the NIIT's Universal Product and Service Code Project seeks ways of locating specific goods and services on the Internet, all proposals therefor recommend the development of formalized coding standards and searching and browsing methods which are expensive and difficult to develop and implement on a world-wide basis. Moreover, such sought after methods will be virtually useless to consumers who have already purchased products and/or services and now seek product and/or service related information on the Internet.

Thus, it is clear that there is great need in the art for a system and method for finding commercial product and service information on the Internet, in a way which avoids the shortcomings and drawbacks of prior art systems, proposals, and methodologies.

OBJECTS AND SUMMARY OF INVENTION

Accordingly, a primary object of the present invention is to provide a novel system and method for finding product and service related information on the Internet, while avoiding the shortcomings and drawbacks of prior art systems and methodologies.

Another object of the present invention is to provide such a system and method, which will accelerate the acceptance of the electronic marketplace on the Internet, particularly by consumers and small businesses alike.

Another object of the present invention is to provide such a system and method, wherein virtually any type of product or service can be registered with the system by symbolically linking or relating (i) its preassigned Universal Product or Service Number (e.g. UPC number) or at least the Manufacture Identification Number (MIN) portion thereof with (ii) the Uniform Resource Locators (URLs) of one or more information resources on the Internet (e.g. the home page of the manufacturer's Web-site) related to such products or services.

Another object of the present invention is to provide such a system and method with an improved Internet browser or Internet application tool having both an "Internet Product/Service Information (IPSI) Finder" button for entering the "IPSI Finder Mode" of the system when it is selected, and also a "Universal Product/Service Number (UPSN) Search" button for entering the "UPSN Search Mode" when the "UPSN Search" button is selected.

Another object of the present invention is to provide such a system, wherein when the system is in its IPSI Finder Mode, a predesignated information resource (e.g. advertisement, product information, etc.) pertaining to any commercial product or service registered with the system can be automatically accessed from the Internet and displayed from the Internet browser by simply entering the registered product's UPN or the registered service's USN into the Internet browser.

Another object of the present invention is to provide such a system, wherein during the "UPSN Search Mode" of the system, a predesignated information resource (e.g. advertisement, product information, etc.) pertaining to any commercial product or service registered with the system can be automatically accessed from the Internet and displayed from the Internet browser by simply entering the registered product's trademark(s) and/or associated company name into the Internet browser.

Another object of the present invention is to provide such a system, wherein a predesignated information resource pertaining to any commercial product or service having been assigned a Universal Product Number (UPN) or Universal Service Number (USN) can be accessed from the Internet and displayed from the Internet browser by simply selecting its IPSI Finder button and then entering the UPN or USN numeric string into a dialogue box which pops up on the display screen of the Internet browser program.

Another object of the present invention is to provide such a system in which a relational database, referred to as "an Internet Product and Service Directory (IPSD)," is realized on one or more data-synchronized IPSD Servers for the purpose of registering product and service related information, namely: (i) information representative of commercial product descriptions, the trademarks used in connection therewith, the company names providing and/or promoting such products, the e-mail addresses of such companies, and the corresponding URLs on the Internet specifying current (i.e. up-to-date) Internet Web-site locations providing product-related information customized to such products; and (ii) information representative of commercial service descriptions, the servicemarks used in connection therewith, the company names providing and/or promoting such services, the E-mail addresses of such companies, and the corresponding URLs on the Internet specifying current (i.e. up-to-date) Internet Web-site locations providing service-related information customized to such services.

Another object of the present invention is to provide such a product information finding system, wherein the URLs symbolically linked to each registered product in the IPSD Servers thereof are categorized as primarily relating to Product Advertisements, Product Specifications, Product Updates, Product Distributors, Product Warranty/Servicing, and/or Product Incentives (e.g. rebates, discounts and/or coupons), and that such URL categories are graphically displayed to the requester by way of easy-to-read display screens during URL selection and Web-site connection.

Another object of the present invention is to provide a novel method of carrying out electronic-type commercial transactions involving the purchase of products and services which are advertised on the Internet at uniform resource locations (URLs) registered with the IPSI system of the present invention.

Another object of the present invention is to provide a novel system and method of finding the UPN or USN associated with any particular registered product or service, respectively, by simply selecting a GUI button on the Internet browser display screen in order to enter a "UPSN Search Mode", whereby (i) a dialogue box is displayed on the display screen requesting any known trademarks associated with the product, and/or the name of the company that

makes, sells or distributes the particular product, and (ii) the corresponding UPN (i.e., UPC number or EPC number) registered with the IPSD Servers is displayed to the user for acceptance, whereupon the Internet information resource locators (URLs) are automatically accessed from the IPSD Servers and displayed on the display screen of the Internet browser for subsequent URL selection and Web-site connection.

Another object of the present invention is to provide such a system and method, wherein during the UPSN Search Mode, the UPN (e.g. UPC number) associated with any registered product can be found within the database of the IPSD Server using any trademark(s) and/or the company name commonly associated with the product, and the USN number associated with any registered service can be found within the database of the IPSD Server using any servicemark(s) and/or the company name commonly associated with the service.

Another object of the present invention is to provide such a system and method in the form of an electronic kiosk installed within a store and having an automatic projection-type, laser scanning bar code symbol reader for reading the UPC numbers on products being offered for sale in the store, and also a video display screen for displaying product-related information accessed from hyper-linked Web-sites on the Internet.

Another object of the present invention is to provide a novel method of constructing a relational database for use within the product and service information finding system of the present invention.

Another method of the present invention is to provide such a method of database construction, wherein the relational database is initially "seeded" with (i) the six digit UPC Manufacturer Identification Numbers (MIN) incorporated into the first six characters of each UPC number applied to the products thereof and (ii) the URLs of the Web-site home pages of such manufacturers, and is subsequently extended and refined with the participation of each registered manufacturer (and/or product distributor) by adding to the database (iii) the 12 digit UPC numbers assigned to each product sold thereby and (iv) the URLs symbolically linked to each such corresponding product.

Another object of the present invention is to provide such a system and method, in which Web-site-based advertising campaigns can be changed, modified and/or transformed in virtually any way imaginable by simply restructuring the symbolic links between the products and/or services in the campaign using current (i.e. up-to-date) Web-site addresses at which Web-site advertisements and information sources related thereto are located on the Internet.

Another object of the present invention is to provide a novel system and method of automatically soliciting companies to register their products and services within the databases of such IPSD Servers in order that product and service related information of a multimedia nature (e.g. Web-sites), once registered therewith, can be easily found on the Internet by any potential consumer using the system and method of the present invention.

These and other objects of the present invention will become apparent hereinafter and in the claims to Invention.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of how to practice the Objects of the Present Invention, the following Detailed Description of the Illustrative Embodiments should be read in conjunction with the accompanying Drawings, wherein:

FIG. **1** is a schematic diagram of a first illustrative embodiment of the product and service information finding system of the present invention shown embedded with the infrastructure of the global computer communications network known as the "Internet", and comprising a plurality of data-synchronized Internet Product and Service Directory (IPSD) Servers connected to the infrastructure of the Internet, a plurality of Internet Product and Service Information (IPSI) Servers connected to the infrastructure of the Internet, and a plurality of Client Systems connected to the infrastructure of the Internet;

FIG. **1A** is a schematic representation of an exemplary display screen produced by a graphical user interface (GUI) based web browser program running on a Client System and providing an on-screen IPSI Finder button and an on-screen UPSN Search button for carrying out the IPSI finding method of the present invention;

FIG. **1B** is a schematic representation of an exemplary display screen produced by a GUI-based web browser program running on a Client System and providing an on-screen IPSD Web-site Finder button for instantly connecting to the IPSD Web-site and carrying out the Internet Product and Service Information finding method of the present invention;

FIG. **2A1** is a schematic representation of the relational-type IPSI Registrant Database maintained by each IPSD Server that is configured into the IPSI finding system of the illustrative embodiment of the present invention, showing the information fields for storing (i) the information elements representative of the UPN (e.g. UPC numeric data structure, National Drug Code (NDC) numeric data structure, and/or European Product Code (EPC) alphanumeric data structure), URLs, trademark(s) (TM_i), Company Name (CN_i), Product Description (PD_i) and E-mail Address (EMA_i) thereof symbolically-linked (i.e. related) for a number of exemplary IPSI Registrants listed (i.e. registered) with the IPSI Registrant Database maintained by each IPSD Server, and (ii) the information elements representative of the UPN (e.g. UPC numeric data structure, National Drug Code (NDC) numeric data structure, and/or European Product Code (EPC) alphanumeric data structure), URLs, Servicemark(s) (SM_i), Company Name (CN_i), Service Description (SD_i) and E-mail Address (EMA_i) thereof symbolically-linked for a number of exemplary IPSI Registrants registered with the IPSI Registrant Database maintained by each IPSD Server;

FIG. **2A2** is a schematic representation of the information subfield structure of the URL Information Field of the IPSD Database of FIG. **2A1**, showing the Product Advertisement Information Field, the Product Specification (Description) Information Field, the Product Update Information Field, the Product Distributor Information Field, the Product Warranty/Servicing Information Field, the Product Incentive Information Field thereof, the Product Review Information Field, and Miscellaneous Information Field;

FIG. **2B** is a schematic representation of the relational-type Non-IPSI Registrant Database maintained by each IPSD Server that is configured into the IPSI finding system of the illustrative embodiment of the present invention, showing the information fields for storing (i) the information elements representative of the Company Name (CN_i), Trademark(s) (TM_i) registered by the associated Company, and E-Mail Address (EMA_i) thereof symbolically-linked for a number of exemplary Non-IPSI registrants listed within the Non-IPSI Registrant Database maintained by each IPSD Server, and (ii) the information elements representative of

the Company Name (CN_i), Servicemark(s) (SM_i) registered by the associated Company, and E-Mail Address (EMA_i) thereof symbolically-linked for a number of exemplary Non-IPSI registrants listed within the Non-IPSI Registrant Database maintained by each ISPD Server;

FIG. **3**A is a schematic diagram illustrating the high level structure of a first type of communication protocol that can be used among the Client System C_a, the IPSD Server S_b, and the IPSI Server S_c of the IPSI finding system hereof when the GUI browser program running on the Client System is in its IPSI Finder Mode of operation, requesting as input a UPSN (i.e. UPN or USN data structure) to determine the URL(s) of the corresponding product (or service) registered therewith;

FIG. **3**B is a schematic diagram illustrating the high level structure of a first type of communication protocol that can be used among the Client System C_a, the IPSD Server S_b, and the IPSI Server S_c of the IPSI finding system hereof when the GUI browser program on the Client System is in its UPSN Search Mode of operation, requesting as input a trademark (or servicemark) and/or company name in order to determine the UPSN (i.e. UPN or USN data structure) of the corresponding product (or service) and thus the URL(s) registered therewith;

FIG. **4**A is a high level flow chart illustrating the steps involved in carrying out the communication protocol shown in FIG. **3**A when the Client System is in its IPSI Finder Mode of operation;

FIG. **4**B is a high level flow chart illustrating the steps involved in carrying out the communication protocol shown in FIG. **3**A when the Client System is in its UPSN Search mode of operation;

FIG. **5**A is a schematic diagram illustrating the high level structure of a second type of communication protocol that can be used among the Client System C_a, the IPSD Server S_b, and the IPSI Server S_c of the IPSI finding system hereof when the GUI browser program on the Client System is in its IPSI Finder Mode of operation, requiring as input a UPSN to determine the URL(s) of the corresponding product (or service) registered therewith;

FIG. **5**B is a schematic diagram illustrating the high level structure of a second type of communication protocol that can be used among the Client System C_a, the IPSD Server S_b, and the IPSI Server S_c of the IPSI finding system hereof when the GUI browser program on the Client System is in its UPSN Search Mode of operation, requiring as input a trademark (or servicemark) and/or company name in order to determine the UPSN of the corresponding product (or service) and thus the URL(s) registered therewith;

FIG. **6**A is a high level flow chart illustrating the steps involved in carrying out the communication protocol shown in FIG. **5**A when the Client System is in its IPSI Finder Mode of operation; and

FIG. **6**B is a high level flow chart illustrating the steps involved in carrying out the communication protocol shown in FIG. **5**A when the Client System is in its UPSN Search mode of operation.

DETAILED DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENTS OF THE PRESENT INVENTION

Referring to the figures shown in the accompanying Drawings, like structures and elements shown throughout the figures thereof shall be indicated with like reference numerals.

Overview Of The Internet Product And Service Information (IPSI) Finding System Hereof

As shown in FIG. **1**, the product/service information finding system of the present invention is generally indicated by reference numeral **1** and comprises an arrangement of system components, namely: a globally-based digital telecommunications network (such as the Internet) **2** having an infrastructure (including Internet Service Providers (ISPs), Network Service Providers (NSPs), routers, telecommunication lines, channels, etc.) for supporting packet-switched type digital data telecommunications using the TCP/IP networking protocol well known in the art; one or more Internet Product and Service Directory (IPSD) Servers, each indicated by reference numeral **3** and being connected to the Internet at strategically different locations via the Internet infrastructure and data-synchronized with each other in order that each such Server maintains mirrored a database structure as represented in FIGS. **2A1** through **2**B; a plurality of Internet Product and Service Information (IPSI) Servers, each indicated by reference numeral **4** and being connected to the Internet via the Internet infrastructure; and a plurality of User (or Client) Computers, each indicated by reference numeral **5** and being connected to the Internet via the Internet infrastructure.

In a first illustrative embodiment of the system shown in FIG. **1**, each Client Computer **5** has an GUI-based Internet browser program (e.g. Netscape, Internet Explorer, Mosaic, etc.) which has been provided with a suitable plug-in type module constructed in such as way to provide the functionalities of the present invention. An exemplary display screen produced by the GUI-based web browser program is set forth in FIG. **1**A. As shown, the GUI-based web browser program provides an onscreen IPSI Finder Button **8** and an on-screen US/PN Search Button **9** for carrying out the IPSI finding method of the present invention. The details of these functions will be described hereinafter.

In an alternative embodiment of the system shown in FIG. **1**, each Client Computer has a conventional GUI-based web browser program (e.g. Netscape, Internet Explorer, Mosaic, etc.) with a plug-in type module, such as CyberFinder™ navigational software by Aladdin Systems, Inc., of Watsonville, Calif., that provides an on-screen graphical icon for a "IPSI Web-site Finder" function. An exemplary display screen **10** produced by such a GUI-based web browser program is set forth in FIG. **1**B. As shown, the on-screen IPSI Web-site Finder icon functions as an "IPSI Web-site Finder" Button **11** for instantly connecting the Client System to the IPSI Web-site (i.e., on each IPSD Server) and carrying out the Internet Product and Service Information (IPSI) finding method of the present invention. Upon selecting this button (e.g. by a clicking of the mouse), the user is automatically connected to the IPSI Web-site (supported on each IPSD Server), at whose "home page" appears the IPSI Finder and UPSN Search buttons described above appear and functionalities represented thereby. The URL for the home page of the IPSI Web-site should be selected with marketing considerations in mind, for example, "http://www.ipf.com" or "http://www.ipsi.com" similar in form with the URLs of other information search-engines and directories currently available on the Internet. Alternatively, the URL of the home page of the PSI Web-site can be recorded as a browser "bookmark" for easy recall and access through a conventional GUI-based Internet browser. Once at the home page of the IPSI Web-site, an Internet user can find product and service related information on the Internet in essentially the same way as when using the web browser program of FIG. **1**A.

In the illustrative embodiment, each synchronized IPSD Server **3** can be realized by, for example, the PowerMac® Internet Server from Apple Computer, Inc. or any other suitable computing machine that can perform the function of a Server in a web-based, client-server type computer system architecture of the illustrative embodiment. As shown in FIG. **1**, each IPSD Server is interfaced with an ISP **13** in a conventional manner. The actual number of IPSD Servers used in any particular application will depend on various factors including, for example, user demand, Internet traffic conditions, network router capacity and performance, etc. Each such IPSD Server is assigned a static TCP/IP address and a unique domain name on the Internet. Each IPSD Server is also provided with (i) Internet networking software to support the TCP/IP networking protocol, (ii) an Application Programming Interface (API) for Web-site and application program development and (iii) Web-site server software for creating and maintaining the IPSI Registrant Database and the Non-IPSI Registrant Database schematically illustrated in FIGS. **2A** and **2B**, respectively. Such databases can be expressed in the 4th Dimension® SQL Language, the Sybase language, or any other suitable database language which allows for database programming and database connectivity over the Internet. A suitable development program for creating a dynamic Web-site with the integrated database structures of FIGS. **2A1**, **2A2** and **2B** is the "4D Web SmartServer" from ACI, Inc. Data synchronization among such databases can be achieved using conventional data synchronization techniques well known in the art. In addition, a backup and mirroring program can be used to maintain data security. Preferably, the synchronized IPSD Servers are maintained by a team of network managers under the supervision of one or more webmasters.

Similarly, each IPSI Server **4** can be realized by, for example, the PowerMac® Internet Server from Apple Computer, Inc., or any other computing machine that can perform the function of a Server in a web-based, client-server type computer system architecture of the illustrative embodiment. As shown in FIG. **1**, each IPSI Server is interfaced with an ISP **13** in a conventional manner. Each such IPSI Server is assigned a static TCP/IP address and a unique domain name on the Internet. Each IPSI Server is also provided with (i) Internet networking software to support the TCP/IP networking protocol, (ii) an Application Programming Interface (API) for application program development and (iii) Web-site server software for creating and maintaining hypermedia-type Web-sites containing product and/or service related information of a multi-media nature. Such Web-sites can be expressed in HTML and/or VRML or any other suitable language which allows for Web-site construction and Web-site connectivity. Web-site management software, such as Adobe® SiteMill™, should be used to maintain correct hyper-links for any particular Web-site. Preferably, the IPSI Servers are maintained by a team of network managers under supervision of one or more webmasters.

Each User (i.e. Client) Computer **5** can be realized by any computing system employing operating system (OS) software (e.g. Macintosh, Windows, Unix etc.) which supports an Internet browser program (e.g. Netscape, Internet Explorer, Mosaic, etc.) which includes Internet networking software that supports the TCP/IP networking protocol, and provides a GUI-based Web browser interface. Alternatively, Client Systems may also be realized by any of the following systems: (i) a Newton MessagePad 130 (running the Newton 2.0 Operating System and NetHopper™ Internet Software); (ii) a Pippin™ computer system from Apple Computer, Inc.; (iii) a network computer (NC) that supports the Java™ programming language and Java applets expressed therewith; (iv) a Sony® WebTV Internet Terminal (supported by the WebTV Service provided by WebTV Network, Inc.); or the like. As shown in FIG. **1**, each Client Computer is interfaced with an ISP **13** in a conventional manner. Each such Client System may be assigned a static TCP/IP address and a unique domain name on the Internet, or one may be dynamically assigned thereto by way of its ISP depending on its connectivity. Optionally, each Client System may include Web-site server software for creating and maintaining one or more hypermedia-type Web-sites in a manner well known in the art.

Typically, each Client System **5** will be maintained by consumers (and/or) potential consumers of products and/or services, about which information can be found on the Internet. It is understood, however, that a Client System can be realized in the form of computer-based kiosks located in supermarkets, department stores, retail outlets, or other public location where products and/or services are being sold or offered for sale, and/or serviced. In one embodiment of the computer-based kiosk, a visual display screen, keyboard and pointing device would be provided in the conventional manner to enable consumers to operate its GUI-based browser and thus carry out the method of the present invention. In an alternative embodiment of the kiosk-based Client System, an integrated bar code reader is provided for reading UPC symbols printed on products (as well as UPNs printed on service-related brochures), and a visual display screen is provided for viewing product and service related information automatically displayed thereon in response to the entry of the UPSN information scanned into the system.

The Database Structure of the IPSD Server

In the illustrative embodiment of the present invention, each data-synchronized IPSD Server **4** of the preferred embodiment maintains at least two different relational-type databases, namely: a IPSI Registrant Database for storing information about manufacturers and/or service providers whose products and/or services are registered with the system; and a Non-IPSI Registrant Database for storing information about manufacturers and/or service providers whose products and/or services are not registered with the system. A schematic representation of the IPSI Registrant Database is shown in FIG. **2A1**, whereas a schematic representation of the Non-IPSI Registrant Database is shown in FIG. **2B**.

As shown in FIG. **2A1**, the relational-type IPSI Registrant Database maintained by each IPSD Server comprises a plurality of labeled information fields for each product or service "registered" therewith, namely: an IP/SN Information Field for storing information (e.g. numeric or alphanumeric string) representative of the Universal Product or Service Number (e.g. twelve digit UPC number) assigned to the product or service; a Company Name Information Field for storing information (e.g. numeric or alphanumeric string) representative of the name of the company making, selling or distributing the corresponding product or service; a URL Information Field for storing information (e.g. numeric or alphanumeric string) representative of the Universal Resource Locator (URL) or Universal Resource Locators (URLs) at which information (or the multimedia type) can be found on the Internet relating to the corresponding product or service; a Trademark/Servicemark Information Field for storing information (e.g. text and/or alphanumeric strings) representative of each trademark used in connection the promotion, sale, distribution and/or use of the corresponding product or service, and preferably registered with

the United States Patent and Trademark Office (USPTO) or other governmental agency; a Product Description Information Field for storing information (e.g. text strings) descriptive of the corresponding product or service; an E-mail Address Information Field for storing information (e.g. numeric or alphanumeric string) representative of the e-mail address of the corresponding company (e.g. manufacturer) on the Internet; and a Status Information Field for storing information (e.g. numeric or alphanumeric string) representative of whether the company associated registered product or service has paid their monthly, quarterly or annual registration fees associated with registration within the IPSD Servers of the information finding system hereof. Notably, each information item contained with the information field shown along the same horizontal line of FIG. **2A1** are related or linked.

In general, the URL stored in the URL Information Field specifies the address of an information resource on the Internet (Web), and thus may point to any one of the following types of information resources: a HTML document or file on the World Wide Web (expressed in the HyperText Markup Language); a single record in a database; the front-end of an Internet program such as Gopher; or the results of a query made using another program. In accordance with convention, the syntactic structure of each URL generally comprises: a Protocol Specifier, such as "http", "ftp", "gopher", "news", or "mailto", and specifies the type of resource to which the URL is pointing (i.e. connecting) to; a Host Indicator, represented by double slashes "//" if the URL is requesting information from a Web Server; Server Name comprising a Internet Domain Name (e.g. "www."), the address of the Web Server (e.g. "ibm."), and a designator (e.g. "com", "edu", "int", "mil", "net", "org", etc.) identifying who owns the server or where it is located; a Path Name, such as "Products/Computers/", indicating a path to the destination information file on the identified Server; and a Resource Name (including file extension, e.g. ".html"), such as "aptiva.html", identifying the actual named information file that contains existing information resource specified by the URL.

As used herein, as well as in the claims to Invention, the term "registered" and the variants thereof shall be understood to mean listed or having an entry within a database. Such listing or entry can be achieved in a variety of ways including, but not limited to the following: (i) by specific request of the associated company or business; or (ii) by the system administrator without a request and/or authorization of the corresponding company or business linked to the product or service.

Notably, each information item contained within the information field shown along the same horizontal line of FIG. **2A1** are symbolically related or linked. Different products and/or services of the same registrant or related registrant may also be linked together so that a user looking for information about a particular product or service is automatically provided URLs which are assigned to related products of the registrant. The automated linking of the URLs may satisfy the goals or objectives of a particular advertising and/or marketing campaign or product/service promotion program of the registrant company. As it may be desirable to relate particular products and services at particular points in time, the relationships therebetween can be dynamically changed dynamically within the IPSI Registrant Database. This can be effected by a straightforward database updating operation of the system administrator (or manager) who, in theory, can be located virtually anywhere throughout the world. Expectedly, such database updating operations would be carried out using appropriate system access and security procedures well known in the art.

Inasmuch as the UPC data structure is presently employed as a universal product identifier (i.e. a primary data structure) in a majority of industries throughout the world, its twelve (12) digit numeric string will be a preferred UPN (in many applications) for purposes of carrying out the principles of the present invention. This twelve (12) digit human-readable number, printed on the bottom of each UPC label (and encoded within the bars and spaces of the UPC label itself), comprises: (i) a six digit manufacturer number assigned to the manufacturer by the Uniform Code Council, Inc. (UCC) of Dayton, Ohio, and consisting of a one digit "number system" number and a five digit manufacturer code; (ii) a five digit product number assigned to the product by the manufacturer; and (iii) a one digit modulo check digit (mathematically calculated) and added to each UPC number to ensure that the code has been read correctly by the bar code reader.

In order to provide the requester greater control over what information is actually displayed on its Client System, the URL Information Field of the IPSI Database shown in FIG. **2A1** contains a number of information subfields. As shown in FIG. **2A2**, these information subfields comprise: a Product Advertisement Information Field for storing information representative of URLs pointing to information on the Internet relating to advertising and/or promotion of the product; a Product Specification (Description) Information Field for storing information representative of URLs pointing to information on the Internet relating to specifications on the product; a Product Update Information Field for storing information representative of URLs pointing to information on the Internet relating to product updates, recalls, notices, etc; a Product Distributor Information Field for storing information representative of URLs pointing to information on the Internet relating to distribution, sale and/or ordering of the product; a Product Warranty/Servicing Information Field for storing information representative of URLs pointing to information on the Internet relating to warranty, extended warranty offerings, servicing and maintenance of the product; a Product Incentive Information Field (e.g. rebates, discounts and/or coupons) for storing information representative of URLs pointing to information on the Internet relating to rebates, discounts and sales on the product; a Product Review Information Field for storing information representative of URLs pointing to information on the Internet relating to reviews, analysis, testing, inspection and/or comparison of the product; and Miscellaneous Information Field for storing information representative of URLs pointing to information on the Internet relating to miscellaneous aspects of the product. Each URL symbolically linked to each registered product in the Registered IPSI Database is categorized within one or more of these URL categories. Preferably, the manufacturer and its advertising and marketing personnel will actively participate in the selection of the URLs and their classification into the above-defined (or like) categories. Through such participation, the business objectives of any particular company can be promoted by the product information finding system of the present invention. Preferably, easy-to-read display screens are used to display and to select URLs contained within the above-described information subfields. In this way, the requester is provided with soley the kind of product-related information which he or she seeks.

It is understood that at present, few (if any) services have been assigned a UPC number in the manner that nearly all consumer products have been assigned in the contemporary

period. In spite of this fact, however, the present invention contemplates the need and utility of widespread assignment of UPC (or similar) numbers to particular services (as well as the imprinting of UPC (or similar) symbols on printed service brochures and advertisements. Notably, assigning UPC (or like) numbers to particular services, and labeling printed and graphical brochures and advertisements with such universal numbers, will provide a number of new opportunities hitherto unavailable.

In particular, service-related information could be easily found (i.e. located and accessed) on Web-sites using the system and method of the present invention, and thereafter the service easily procured through an electronic data transaction. In accordance with the present invention, this can be achieved by uniquely identifying and assigning "particular" services by a Universal Service Code (USC) which has many if not all of the attributes of a conventional UPC. While not necessary, a single digit may be optionally added to the USC in order to demark that services, rather than products are being identified. An example of such USC labeling would be the printing of an assigned UPC label (number) on: admission tickets to a theatrical, dramatic or musical performance and/or its playbill; admission tickets to a movie; admission tickets to a concert and/or its concert program; admission tickets to a sporting event and/or its sports program; admission tickets to an art, science or history museum; admission tickets to the zoo or botanical gardens; and the like. The UPC label would be encoded to identify a particular event at which an entertainment, educational or professional service is provided. The UPC label printed on the tangible medium associated with the promotion of or access to the particular service would then be registered with the IPSI Registrant Database of the system hereof, along with the name of the provider of the service, and a list of URLs that identify the Web locations at which particular kinds of information related to the particular service can be found (in accordance with the categories of FIG. **2A2**).

As shown in FIG. **2B**, the Non-IPSI Registrant Database maintained by each IPSD Server comprises a plurality of labeled information fields for each product or service that is not currently registered with the IPSD Server, namely: an IPSN (i.e. IPN and ISN) information Field for storing information (e.g. numeric or alphanumeric string) representative of the Universal Product or Service Number (e.g. a number from a UPC numbering system—a UPC number—) assigned to the non-registered product or service; a Company Name Information Field for storing information (e.g. numeric or alphanumeric string) representative of the name of the company making, selling or distributing the corresponding non-registered product or service; a Trademark/Servicemark Information Field for storing information (e.g. text and/or alphanumeric strings) representative of each trademark (or servicemark) used in connection with the promotion, sale, distribution and/or use of the corresponding product or service, and preferably registered with the USPTO or other governmental agency; a Product Description Information Field for storing information (e.g. text strings) descriptive of the corresponding product or service; and an E-mail Address Information Field for storing information (e.g. numeric or alphanumeric string) representative of the e-mail address of the corresponding company (e.g. manufacturer) on the Internet; a Status Information Field for storing information (e.g. numeric or alphanumeric string) representative of whether the company associated non-registered product or service has been solicited by the IPSD Server, and on what dates registration solicitation has occurred. Notably, each information item contained with the information field shown along the same horizontal line of FIG. **2A1** are related or linked. The information required to construct the Non-IPSI Registrant Database shown in FIG. **2B** can be readily obtained from a number of commercially or publicly available information sources (e.g., the Universal Code Council, Inc., Dayton, Ohio; Quickresponse Services, Inc. Of Richmond. Calif.; General Electric Information Services (GEIS) of Delaware, Md.; Infotest International, http://www.infotest.com, etc.).

Communication Protocols For Carrying Out The System And Method Of The Present Invention

In general, there are a number of possible communication protocols that can be used to carry out the system and method of the present invention. In FIGS. **3A** and **3B**, a first communication protocol is schematically depicted for a first system having both the IPSI Finder and UPSN Search Modes of operation, whereas the basic operations carried out thereby are shown in FIGS. **4A** and **4B**. In FIGS. **5A** and **5B**, a second communication protocol is schematically depicted for both the IPSI Finder and UPSN Search Modes of operation, whereas the basic operations carried out thereby are shown in FIGS. **6A** and **6B**. The details of such protocols will be described below.

Referring to FIG. **3A**, the high level structure is shown for a first-type of communication protocol that can be used among the Client System C_a, the IPSD Server S_b, and the IPSI Server S_c of the IPSI finding system hereof when the GUI browser program on the Client System is in its IPSI Finder Mode of operation. FIG. **4A** provides a high level flow chart illustrating the steps involved in carrying out this communication protocol when the Client System is in its IPSI Finder Mode of operation.

In order to enter the IPSI Finder mode of the system, the user selects the "IPSI Finder" button on the GUI-based browser display screen. Then at Block A of FIG. **4A**, a UPSN is provided as input to IPSD Server S_b, and in response thereto the Client System C_a requests the IPSD Server S_b to provide each registered URL_i stored in the IPSI Registrant Database.

At Block B in FIG. **4A**, the IPSD Server S_b analyses the IPSI Registrant Database shown in FIG. **2A1** to determine whether or not a symbolically linked URL_i has been registered with $UPSN_i$ that has been provided as input. If so, then the IPSD Server sends the symbolically linked URL_i to the Client System C_a. If not, then the IPSD records in the URL-request in the Non-IPSI Registrant Database shown in FIG. **2B**.

At Block C in FIG. **4A**, the Client System C_a receives the URL_i from the IPSD Server. Then, in response to a URL selection query based on the content of information subfields shown in FIG. **2A2** and displayed on the screen of the Client System C_a, the client system C_a requests the IPSI Server, identified by the user selected URL_i, to provide the product or service information located by the registered URL_i. Having accessed and displayed such product or service related information at the Client System, the user can review the information at the specified URL_i, acquire knowledge about the product or service, and may, if the option is provided at the URL-specified Web-site, purchase the product or procure (i.e. contract for) the service by way of an on-screen electronic commercial transaction. Such commercial transaction can involve product ordering, delivery specification, and financing through the use of credit or debit card transactions, COD arrangements, or any other financial arrangement acceptable to the vendor of the product or service.

Referring to FIG. **3B**, the high level structure is shown for the first-type of communication protocol that can be used among the Client System C_a, the IPSD Server S_b, and the IPSI Server S_c of the IPSI finding system hereof when the GUI browser program on the Client System is in its UPSN Search Mode of operation. FIG. **4B** provides a high level flow chart illustrating the steps involved in carrying out this communication protocol when the Client System is in its UPSN Search Mode of operation.

In order to enter the UPSN Search Mode of the system, the user selects the "UPSN Search" button on the GUI-based browser display screen. Then at Block A of FIG. **4B**, a trademark TM_i (or servicemark SM_i) and/or a company name CN_i is provided as input to IPSD Server S_b by way of the browser display screen. Then in response thereto, the Client System C_a requests the IPSD Server S_b to provide each registered $UPSN_i$ stored in the IPSI Registrant Database, and if so, then also its URL_i to the Client System.

At Block B in FIG. **4B**, the IPSD Server S_b analyses the IPSI Registrant Database shown in FIG. **2A1** to determines whether or not a symbolically linked $UPSN_i$ has been registered with a TM_i (or SM_i) and/or a company name CN_i that have been provided as input to the IPSD Server S_b by way of the browser display screen. If so, then the IPSD Server sends to the Client System C_a, the URL_i that is symbolically linked to the registered $UPSN_i$. If not, then the IPSD records in the URL-request in the Non-IPSI Registrant Database shown in FIG. **2B** for future registration-request operations related to the T/SM_i sent by the Client System.

At Block C in FIG. **4B**, the Client System C_a receives the URL_i from the IPSD Server. Then, in response to a URL selection query based on the contents of the information subfields shown in FIG. **2A2** and displayed on the screen of the Client System C_a, the Client System requests the IPSI Server, identified by the user selected URL_i, to provide the product or service information. Having accessed and displayed such product or service related information at the Client System, the user can review the information at the specified URL_i, acquire knowledge about the product or service, and may, if the option is provided at the URL-specified Web-site, purchase the product or procure (i.e. contract for) the service by way of an on-screen electronic commercial transaction, as described hereinabove.

Referring to FIG. **5A**, the high level structure is shown for a second, alternative type of communication protocol that may be used among the Client System C_a, the IPSD Server S_b, and the IPSI Server S_c of the IPSI finding system hereof when the GUI browser program on the Client System is in its IPSI Finder Mode of operation. FIG. **6A** provides a high level flow chart illustrating the steps involved in carrying out this communication protocol when the Client System is in its IPSI Finder Mode of operation.

In order to enter the IPSI Finder mode of the system, the user selects the "IPSI Finder" button on the GUI-based browser display screen. Then at Block A of FIG. **6A**, a UPSN is provided as input to IPSD Server S_b, and in response thereto the Client System C_a requests the IPSD Server S_b to provide each registered URL_i stored in the IPSI Registrant Database.

At Block B in FIG. **6A**, the IPSD Server S_b analyses the IPSI Registrant Database shown in FIG. **2A1** to determine whether or not a symbolically linked URL_i has been registered with $UPSN_i$ that has been provided as input. If so, then in response to a URL selection query based on the contents of the information subfields shown in FIG. **2A2** and displayed on the screen of the Client System C_a, the IPSD Server S_b sends to the IPSI Server S_c hosting the user-selected URL_i, a request for the IPSI Server S_c to send product or service information at the selected URL_i to the requesting Client System C_a. If the IPSD Server S_b determines that there does not exist a URL_i in the IPSI Registrant Database symbolically linked with the $UPSN_i$ provided as input to the Client System C_a, then the IPSD Server S_b records the URL-request in the Non-IPSI Registrant Database for future registration operations with the company related to the input $UPSN_i$.

At Block C in FIG. **6A**, the IPSI Server S_c receives the user-selected URL_i sent from the IPSD Server S_b and then provides to the Client System C_a, the product or service information located by the registered URL_i. Having accessed and displayed such product or service related information at the Client System, the user can review the information at the selected URL_i, acquire knowledge about the product or service, and may, if the option is provided at the URL-specified Web-site, purchase the product or service by way of an on-screen electronic commercial transaction.

Referring to FIG. **5B**, the high level structure is shown for the second-type of communication protocol that can be used among the Client System C_a, the IPSD Server S_b, and the IPSI Server S_c of the IPSI finding system hereof when the GUI browser program on the Client System is in its UPSN Search Mode of operation. FIG. **6B** provides a high level flow chart illustrating the steps involved in carrying out this communication protocol when the Client System is in its UPSN Search Mode of operation.

In order to enter the UPSN Search Mode of the system, the user selects the "UPSN Search" button on the GUI-based browser display screen. Then at Block A of FIG. **6B**, a trademark TM_i (or servicemark SM_i) and/or a company name CN_i is provided as input to IPSD Server S_b by way of a dialogue box displayed on the browser display screen. In response thereto, the Client System C_a requests the IPSD Server S_b to determine whether or not a registered $UPSN_i$ (and thus symbolically linked URL_i) is stored in the IPSI Registrant Database. If so, then in response to a URL-selection query based on the content of the information subfields shown in FIG. **2A2** and displayed on the display screen of the Client System C_a, the IPSD Server S_b sends the IPSI Server S_c hosting the user-selected URL_i, a request for the IPSI Server S_c to send product or service information at the selected URL_i to the requesting Client System C_a. If the IPSD Server S_b determines that there is no registered $UPSN_i$ (and thus no symbolically linked URL_i) stored in the IPSI Registrant Database, then the IPSD Server records the URL-request in the Non-IPSI Registrant Database for future registration operations with the company related by the $UPSN_i$ sent by the Client System C_a.

At Block C in FIG. **6B**, the IPSI Server hosting the user-selected URL_i receives the request from the IPSD Server S_b and then provides the product or service information identified by the registered URL_i. Having accessed and displayed such product or service related information at the Client System, the user can review the information at the specified URL_i, acquire knowledge about the product or service, and may, if the option is provided at the URL-specified Web-site, purchase the product or service by way of an on-screen electronic commercial transaction.

The communication protocols described above can be realized using any suitable programming language including, for example, an object-oriented programming language such as the Java programming language.

Registration Of Products And Services With The IPSI System

The utility of the product and service finding tool of the present invention depends in large part on the number of

products and services registered with the IPSI system. In principle, numerous techniques may be employed separately as in combination with each other in order to construct the IPSI and Non-IPSI Registrant Databases supported by the IPSD Servers of the present invention. Five such techniques will be detailed below.

According to a first database construction technique, product registration requests (PRRs) are sent out to each and every company (i.e. manufacturer) which has been issued a six digit UPC Manufacturer Identification Number (MIN) by the UCC, Inc. For the various products which such manufacturers sell, the product registration request should ascertain the various information elements identified in the IPSI Registrant Database of FIGS. **2A1** and **2A2** in order to construct the same.

According to a second database construction technique, a global advertising campaign is launched in order to solicit the various information elements identified in the IPSI Registrant Database of FIG. **2A1** and **2A2** thus register the products (and services) of companies and businesses participating in the program. Preferably, such information is collected by way of e-mail to facilitate database construction operations.

According to a third database construction technique, the IPSI system itself continuously solicits product registrations over time in order to collect information from companies responding favorably to the solicitations. Such solicitation efforts can involve the issuance of product registration requests.

According to a fourth database construction technique, a number of commercial Internet search engines, such as Altavista™, Yahoo™, WebCrawler™, Lycos™, Excite™, and powerful off-line parallel computing machines are enlisted to analyze (i.e. mine) information on the World Wide Web in order to collect and link the information elements specified in the IPSI Registrant Database of FIG. **2A1**.

Once an "initial" IPSI Registrant Database has been constructed using any one or more of the four database construction techniques described hereinabove, companies registered therewith can be periodically contacted in order to update, expand or otherwise the accuracy of the information contained within the database of the IPSI system.

According to a fifth database and preferred construction technique of the present invention, the IPSI Database of the system is initially "seeded" with several items of information obtained and related without the assistance of such manufacturers. Such information items include: (1) the six digit UPC Manufacturer Identification Numbers used in the UPC symbols (i.e. numbers) applied to the products thereof; and (2) the URLs of the Web home pages of UCC-registered manufacturers.

The first step of this database construction method involves obtaining the six digit manufacturer codes issued to specific manufacturers (or vendors) by the Uniform Code Council, Inc. of Dayton, Ohio, or be obtained from various commercial sources including GE Information Services, QuickResponse Services, Inc. At present, about 95,000 manufacturers identification numbers have been issued to manufacturers by the UCC. A string of six zeros (i.e. 000000) may be added to each one of these 95,000 or so six digit Manufacturer Identification Number in order to produce 95,000 or so 12 digit numbers (i.e. hereinafter referred to as "Manufacturer's Reference Numbers) for the 95,000 or so manufacturers (i.e. Vendors) listed in the IPSI Registrant Database under construction. As each such Manufacturer Reference Number has the same length as a UPC number of its manufacturer, this number can be stored in the UPSN Information Field of the Database along with the corresponding manufacturers name being stored in the Company Name Information Field.

The second step of the method involves finding the URL of the Web home page of each of the 95,000 manufacturers who have been assigned a Manufacturers Identification Code and are listed in the Database. Such URL information can be found using conventional off-line search engines that use the name and address of the manufacturer to find the URL of the home page of its Web-site, if it has one. Such URLs are then added to the Database, along with e-mail and/or other addresses of the manufacturer symbolically linked thereto.

Having constructed the "seeded" Database, it can then be used to connect the Client System of users to the home page of Web-sites of manufacturers of particular products. Initially, when an Internet user provides as input to the Client System operating in its UPSN Search Mode, either the first six or all 12 digits of a UPC number (associated with a particular product or service), the IPSD Server need only compare the input UPC number against the six digit Manufacturer Identification Number portion of the Manufacturers Reference Number listed in the "seeded" Database. The corresponding URL of the matching manufacturer is returned to the Client System C_a. In instances of an initially seeded Database, wherein only the six digit Manufacturer Indentification Numbers (or twelve digit Manufacturer Reference Numbers) are listed therein, the users are provided with the URLs of the home pages of the symbollically linked manufacturers (i.e. companies). Then, through mass mailings, advertisement and/or marketing and promotional efforts, the companies whose Manufacturer Identification Numbers (or Manufacturer Reference Numbers) are listed in the Database, as the case may be, are then contacted and requested to actively participate in linking the UPC numbers of their products with the URLs identifying whereon the Internet desired types of product-related information are located. When such URLs are registered within the Database, an inquiring Internet user knowing the corresponding UPC number can specify the exact location of a file containing information on the Web about any particular product (or service). Over time, the Manufacturer Reference Number of each manufacturer will become replaced by the UPC numbers and linked URLs on the WWW, and the users of the system can precisely pinpoint product-related information identified by the manufacturer, its marketing department and/or advertising agency. With manufacturer and advertiser participation and feedback, the initially seeded Database described hereinabove will gradually grow into a robust relational database richly filled with the various information items described in FIGS. **2A1** and **2A2**, including the symbolically linked UPCs and URLs that point to very specific information files within IPSI Servers randomly located throughout the Internet.

Operation of the IPSI Finding System and Method

In each of the above-described embodiments of the system hereof shown in FIGS. **1A** and **1B**, the GUI-based Internet browser program of each Client System is provided with two independent modes of operation, namely: the "IPSI Finder Mode" and the "UPSN Search Mode".

When the "IPSI Finder" button is selected, the system (i.e. browser program) enters its the IPSI Finder Mode. Preferably, the user is provided with a choice of language (e.g. English, German, French, Japanese, Chinese, etc.) by way of an appropriate menu-selection screen. After the desired language selection is made, the home page is dis-

played upon the Client System's display screen. A typical display screen produced from the IPSD Server might read as follows:

Welcome to UPC-REQUEST™, the only Universal Product Information Finding System on the Internet.

Have you purchased a particular product, or are you considering the purchase of a particular product, on which you would like current, up-to-date information from the manufacturer or advertiser?

Look no further than the UPC-REQUEST™ Universal Product Information Finding System."

When the system is in this operational mode, as illustrated in FIGS. **3A**, **4A** and **5A**, **6A**, a Web-based information resource pertaining to any commercial product or service registered with the system can be displayed and selected by the user in order to automatically access the same from the Internet. Such information resources can include advertisements, specifications, operation descriptions, product simulations, purchase information, maintenance information, warranty and servicing information, product updates, distributor information, incentives (e.g. discounts, rebates, coupons, etc.), electronic data transaction screens, etc. In this mode, desired product or service information is obtained by simply manually entering the registered product's UPN (e.g. its UPC's 12 digit numerical string) or the registered service's USN (e.g. its UPC's 12 digit numerical string) into the dialogue box of the Internet browser or Internet application tool. When using the seeded IPSI Database described hereinabove, only the first six digits of the UPC number need be entered into the dialogue box. An exemplary display screen produced from the IPSD Server might be as follows:

"Simply enter the 12 digit UPC the particular product; click REQUEST, and then wait for the display of the list of Web locators (URLs) at which the desired product information can be found on the Internet."

Alternatively, a bar code symbol scanner can be used to enter the UPSN (e.g. UPC or USC number) into the system, thereby avoiding manual keyboard entry operations.

In response to such data entry operations, a list of URLs organized according to the information subfield classifications set forth in FIG. **2A2** are displayed on Client System C_a making the request of the IPSD Server. At this stage, another display screen would appear with an exemplary message as follows:

"Please select the URL from the displayed URL list using the information subfield product information category displayed above. This will connect you to the product information related to the selected URL. You can return to the URL display list at anytime."

Upon selecting a particular URL from the displayed URL list, video and audio information content are automatically displayed on the Client System from the IPSI Server hosting the selected URL.

When the "UPSN Search" button is selected, the system enters its UPSN Search Mode". Preferably, the user is provided with a choice of language (e.g. English, German, French, Japanese, Chinese, etc.) by way of an appropriate menu-selection screen.

When the system is in this operational mode, as illustrated in FIGS. **3B**, **4B** and **5B**, **6B**, a predesignated information resource pertaining to any commercial product or service registered with the system can be automatically accessed from the Internet and displayed from the Internet browser of a Client System. Such information resources can include advertisements, specifications, operation descriptions, product simulations, product upgrade information, purchase information, maintenance information, warranty and servicing information, etc. In this mode, desired product or service information is obtained by simply entering the registered product's trademark(s) or servicemark(s) and/or associated company name into the dialogue box of the Internet browser or Internet application tool. An exemplary display screen produced from the IPSD Server might be as follows:

"Simply enter the trademark used in connection with the particular product and/or the company name of the product's manufacturer; click REQUEST, and then wait for the display of a list of Web locators (URLs) at which desired types of product information can be found on the Internet."

In response to such data entry operations, a list of URLs organized according to the information subfield classifications set forth in FIG. **2A2** are displayed on Client System placing the request. Upon selecting a particular URL from the displayed list thereof, video and audio information content are automatically displayed on the Client System from the IPSI Server hosting the selected URL.

In an alternative embodiment of the present invention, the "IPSI Finder Mode" and the "UPSN Search Mode" can be integrated into a single server application so that there is no need or desire to manually select IPSI Finder and UPSN Search Mode buttons. In such an embodiment, the interaction between the IPSD Server and the requesting Client System can be designed to support the following Web server display screens and script underlying the same:

"Welcome to UPC-REQUEST™, the only Universal Product Information Finding System on the Internet.

Have you purchased a particular product, or considering the purchase of a particular product, on which you would like current, up-to-date information from the manufacturer or advertiser?

Look no further than the UPC-REQUEST™ Universal Product Information Finding System."

"Simply enter the 12 digit UPC number of the particular product, click REQUEST, and await from the list of Web locators (URLs) selected by the manufacturer at which the desired product information can be found?

"If you do not know the UPC number associated with the product you are looking for, then simply enter the trademark used in connection with the particular product and/or the company name of the manufacturer, Then click REQUEST, and wait for the display of the list of Web locators (URLs) at which the desired product information can be found?

"Please select the URL from the displayed URL list by clicking on it. This will connect you to the product information related to the selected URL. You can return to the URL display list at anytime."

Notably, such an integrated Web server application can be realized in a variety of ways. The exact words and graphics used to create an interactive script for an integrated Web server application will vary from embodiment to embodiment.

The Automated Registration Solicitation Mode Of The System

In the illustrative embodiments of the present invention, the data-synchronized IPSD Servers of the system hereof are also provided with an "Automated Registration Solicitation Mode" programmed by the webmaster (or administrator) of the IPSI Web-site. In this mode, each IPSD Server analyzes the data collected within its Non-IPSI Registrant Database. The data analysis determines: (1) which "unregistered"

products or services in the Non-IPSI Registrant Database were the subject of an information request at the IPSD Server; (2) how many hits (requests) were made for the product or service within a predetermined length of time (e.g. one week) by Internet users; and (3) whether the number of requests exceeds a particular "request threshold" (e.g. 100 requests in week period). Then, for each unregistered product (or service) which has exceeded the request threshold, the IPSD Server automatically sends an e-mail message to the associated company. Preferably, the e-mail message is designed to (i) inform the company of recent information requests for their products and/or services, and (ii) solicit the registration of such products and/or services with the IPSD Server. Once registered with the system, such products and services can be easy found on the Internet by anyone wishing to use the product and service finding techniques of the present invention.

The present invention has been described in great detail with reference to the above illustrative embodiments. It is understood, however, that numerous modifications will readily occur to those with ordinary skill in the art having had the benefit of reading the present disclosure.

For example, in the illustrative embodiments described hereinabove, separate databases are maintained by each data-synchronized IPSD Server for (i) registered products and services within the system, and (ii) non-registered products and services within the system. Notably, the reasons for using a dual database design of this sort would be based largely on economics, namely: only those companies who have paid the required maintenance (or registration) fees get their products (or services) and linked URLs "registered" with the system, whereas non-paying companies do not get their products (or services) and linked URLs registered with the system, regardless of how such product-URL or service-URL information is ascertained (e.g. by solicitation versus data mining).

Thus it is contemplated that in some embodiments of the present invention, each IPSD Server will be designed to maintain only a single database for maintaining product-URL and service-URL information currently available on the Internet. In such embodiments of the present invention, the concept of "non-registered" products and services will be avoided altogether, since the system implementation and administration (in all likelihood) will be designed to not require companies to pay maintenance (or registration) fees in order that their products (or services) and linked URLs are registered with the IPSI system. Instead, some alternative income producing scheme will be used in such embodiments of the present invention (e.g., advertisement space, user fees, subscription fees, Internet browser-licensing fees, etc.) for system maintenance and administration.

When practicing the system and method of the present invention, it is preferred that the UPC label (with its human-readable UPC number) assigned to the particular product be attached, embossed or otherwise embodied on an accessible surface thereof. In addition to applying the UPC label to the external packaging of the product, it is preferred that the UPC label also be printed on any and all product instructions and manuals provided with the product. In this way, the UPC number can be easily read by a human being and then used to access a desired type of product information using the system and method of the present invention.

In order that the system hereof can be used to find information pertaining to large products such as automobiles, motorcycles, skidoos, farm machinery, boats, etc., the present invention also contemplates assigning UPC numbers to such products and attaching, embossing or otherwise embodying the same on an accessible surface thereof. Also, the UPC label should be printed on all instruction booklets and/or operating manuals normally provided with the product. In this way, information related to any particular product that is posted anywhere on the Internet and linked to URLs registered with the IPSD Servers of the system hereof can be readily found using the uniquely assigned UPC number assigned thereto by the manufacturer at the time of sale. Notably, multimedia information about such products can be most helpful in regard to the operation, repair and servicing of such products.

The system and method of the present invention has been shown to combine the use of UPC numbers, trademarks and company names when making a product information request of the system. It is understood, however, that the present invention can be practiced using any one of these items of information, alone or in combination with each other, in order to place a product (or service) information request with the system hereof.

These and all other such modifications and variations are deemed to be within the scope and spirit of the present invention as defined by the accompanying claims to Invention.

What is claimed is:

1. A system for finding and serving information pertaining to a particular consumer product and the manufacturer thereof on the Internet, said system comprising:

(1) an Internet database serving subsystem operably connected to the infrastructure of the Internet and including

(1A) an information storage subsystem for storing first and second sets of information,

said first set of information being representative of

(i) a plurality of manufacturer identification numbers (MINs) assigned to a plurality of manufacturers of consumer products, each said MIN being assigned to one of said plurality of manufacturers of consumer products, and

(ii) a plurality of home-page specifying URLs symbolically linked to said plurality of MINs, each said home-page specifying URL being symbolically linked to one of said plurality of manufacturers of consumer products and specifying the location of a manufacturer World Wide Web (WWW) site located on the Internet, having a home page on the WWW and being related to one of said plurality of manufacturers of consumer products, and

said second set of information being representative of

(i) a plurality of universal product numbers (UPN) assigned to a plurality of consumer products made by said plurality of manufacturers, each said UPN being assigned to one of said plurality of consumer products, and

(ii) a plurality of product-information specifying URLs symbolically linked to said plurality of UPNs, each said product-information specifying URL including one of said plurality of MINs, and being symbolically linked to one of said plurality of consumer products and specifying the location of an information resource located on the Internet related to at least one of said plurality of consumer products, and

(1B) request servicing means for servicing a request for information about one of said plurality of products located on the Internet, made by a client subsystem operably connected to the Internet, wherein said request is transmitted to said Internet database serving subsystem for processing and includes information representative of the UPN assigned to said consumer

product on which product-related information located on the Internet is being sought by a consumer using said client subsystem,

wherein said request servicing means automatically compares the UPN included in said request against said plurality of MINs stored in said information storage subsystem, and

(i) automatically returns to said client subsystem, the home-page specifying URL symbolically linked to the MIN contained within the UPN included in said request if, at the time said request was made, no product-information specifying URLs have been symbolically linked to the UPN included in said request, within said information storage subsystem, and

(ii) automatically returns to said client subsystem, one or more of URLs symbolically linked to said UPN included in said request, if, at the time said request was made, one or more product-information specifying URLs have been symbolically linked to the UPN included in said request, within said information storage subsystem; and

(2) a plurality of product-information containing servers, each said product-information containing server being connected to the Internet and storing product-related information resources related to at least one of

(i) one or more of the WWW sites of said plurality of manufacturers of consumer products, and

(ii) one or more of said plurality of consumer products,

wherein the location of each said product-related information resource on the Internet is specified by one said plurality of product-information specifying URLs, and

wherein the location of the home page of each said WWW site is specified by one of said plurality of home-page specifying URLs, and

wherein said client subsystem can use

(i) the one or more product-information specifying URLs returned by said request servicing means to access product-related information from said one or more of said plurality of product-related information containing servers, and

(ii) the home-page specifying URL returned from said request servicing means to access the home-page of the manufacturer's WWW site from one or more of said plurality of product-related information containing servers.

2. The system according to claim **1**, wherein said one or more URLs are arranged for display on said client subsystem in accordance with a predetermined product-related information classification scheme.

3. The system according to claim **1**, wherein one or more of said product-related information resources comprise HTML-encoded documents located on the WWW.

4. The system according to claim **3**, wherein one or more of said product-information specifying URLs specify the location of said HTML-encoded documents located on the WWW.

5. The system according to claim **1**, wherein said client subsystem is a WWW-enabled computer system selected from the group consisting of: a computer-based kiosk provided with a first WWW browser and a first bar code symbol reading device operably connected to said first WWW browser; a portable computer provided with a second WWW browser and a second bar code symbol reading device operably connected to said second WWW browser; and a desktop computer system provided with a third WWW browser and a third bar code symbol reading device operably connected to said third WWW browser.

6. The system according to claim **1**, wherein said UPN is a UPC.

7. The system of claim **1**, wherein said Internet database serving subsystem comprises an Internet information server and a relational database subsystem operably connected to said Internet database serving subsystem.

8. A method of finding and serving information pertaining to a particular consumer product and the manufacturer thereof on the Internet, said method comprising the steps of:

(a) storing first and second sets of information in an Internet database serving subsystem operably connected to the infrastructure of the Internet,

said first set of information being representative of

(i) a plurality of manufacturer identification numbers (MINs) assigned to a plurality of manufacturers of consumer products, each said MIN being assigned to one of said plurality of manufacturers of consumer products, and

(ii) a plurality of home-page specifying URLs symbolically linked to said plurality of MINs, each said home-page specifying URL being symbolically linked to one of said plurality of manufacturers of consumer products and specifying the location of a manufacturer World Wide Web (WWW) site located on the Internet, having a home page on the WWW and being related to one of said plurality of manufacturers of consumer products, and

said second set of information being representative of

(i) a plurality of universal product numbers (UPN) assigned to a plurality of consumer products made by said plurality of manufacturers, each said UPN being assigned to one of said plurality of consumer products, and

(ii) a plurality of product-information specifying URLs symbolically linked to said plurality of UPNs, each said product-information specifying URL including one of said plurality of MINs, and being symbolically linked to one of said plurality of consumer products, and specifying the location of an information resource located on the Internet related to at least one of said plurality of consumer products; and

(b) transmitting to said Internet database serving subsystem, a request made by a client subsystem operably connected to the Internet, for product-related information on the Internet about one of said plurality of consumer products, said request including information representative of the UPN assigned to a particular consumer product on which product-related information located on the Internet is being sought by a consumer using said client subsystem,

(c) said Internet database serving subsystem receiving said request and automatically comparing the UPN included in said request against said plurality of MINs stored in said information storage subsystem, and

(i) automatically returning to said client subsystem, the home-page specifying URL symbolically linked to the MIN contained within the UPN included in said request, if, at the time said request is made, no product-information specifying URLs have been symbolically linked to the UPN included in said request, within said information storage subsystem, and

(ii) automatically returning to said client subsystem, one or more of URLs symbolically linked to said

UPN included in said request, if, at the time said request is made, one or more product-information specifying URLs have been symbolically linked to the UPN included in said request, within said information storage subsystem; and

(d) said client subsystem using one or more URLs returned during step (c) to access product-related information resources and the home-page of manufacturer WWW sites from one or more product-related information containing servers, wherein each said product-related information containing server is connected to the Internet and stores product-related information resources related to at least one of

(i) one or more of the WWW sites of said manufacturers of consumer products, and

(ii) one or more of said plurality of consumer products, wherein the location of each said consumer product-related information resource on the Internet is specified by one said product-information specifying URL, and

wherein the location of the home-page of each said WWW site is specified by one of said plurality of home-page specifying URLs.

9. The method according to claim **8**, wherein said one or more product-information specifying URLs are arranged for display on said client subsystem in accordance with a predetermined product-related information classification scheme.

10. The method according to claim **8**, wherein one or more of said product-related information resources comprise HTML-encoded documents on the WWW, and wherein one or more of said product-information specifying URLs specify the location of said HTML-encoded documents.

11. The method according to claim **8**, wherein said client subsystem is a WWW-enabled computer system selected from the group consisting of: a computer-based kiosk provided with a first WWW browser and a first bar code symbol reading device operably connected to said first WWW browser; a portable computer provided with a second WWW browser and a second bar code symbol reading device operably connected to said second WWW browser; and a desktop computer system provided with a third WWW browser and a third bar code symbol reading device operably connected to said third WWW browser.

12. The method according to claim **8**, wherein said UPN is a UPC.

13. The method of claim **8**, wherein said Internet database serving subsystem comprises an Internet information server and a relational database subsystem operably connected to said Internet information server.

14. A system for finding and serving the home-page of a World Wide Web (WWW) site of a manufacturer of a particular consumer product, said system comprising:

(1) an Internet database serving subsystem operably connected to the infrastructure of the Internet and including

(1A) an information storage subsystem for storing a set of information being representative of

(i) a plurality of manufacturer identification numbers (MINs) assigned to a plurality of manufacturers of consumer products, each said MIN being assigned to one of said plurality of manufacturers of consumer products, and

(ii) a plurality of home-page specifying URLs symbolically linked to said plurality of MINs, each said home-page specifying URL being symbolically linked to one of said plurality of manufacturers of consumer products and specifying the location of a manufacturer WWW site located on the Internet, having a home page on the WWW and being related to one of said plurality of manufacturers of consumer products, and

(1B) request servicing means for servicing a request made by a client subsystem operably connected to the Internet, wherein said request is transmitted to said Internet database serving subsystem for processing and includes information representative of the UPN assigned to said consumer product on which product-related information located on the Internet is being sought by a consumer using said client subsystem,

wherein said request servicing means automatically compares the UPN included in said request against said plurality of MINs stored in said information storage subsystem, and automatically returns to said client subsystem, the home-page specifying URL symbolically linked to the MIN contained within the UPN included in said request;

(2) a plurality of product-information containing servers, each said product-information containing server being connected to the Internet and storing information resources including the home-page of at least one or more of the WWW sites of said plurality of manufacturers of consumer products,

wherein the location of the home-page of each said WWW site is specified by one of said plurality of home-page specifying URLs, and

wherein said client subsystem can use the home-page specifying URL returned by said request servicing means to access from at least one of said product-information containing servers, the home-page of the WWW site of the manufacturer symbolically linked to said MIN contained within the UPN included in said request.

15. The system according to claim **14**, wherein said home-page specifying URL returned by said request servicing means is automatically displayed on said client subsystem for accessing the home-page of the WWW site of the manufacturer symbolically linked to said MIN contained within the UPN included in said request.

16. The system according to claim **14**, wherein one or more of said product-related information resources comprise HTML-encoded documents located on the WWW.

17. The system according to claim **16**, wherein one or more of said product-information specifying URLs specify the location of said HTML-encoded documents on the WWW.

18. The system according to claim **14**, wherein said client subsystem is a WWW-enabled computer system selected from the group consisting of: a computer-based kiosk provided with a first WWW browser and a first bar code symbol reading device operably connected to said first WWW browser; a portable computer provided with a second WWW browser and a second bar code symbol reading device operably connected to said second WWW browser; and a desktop computer system provided with a third WWW browser and a third bar code symbol reading device operably connected to said third WWW browser.

19. The system according to claim **14**, wherein said UPN is a UPC.

20. The system of claim **14**, wherein said Internet database serving subsystem comprises an Internet information server and a relational database subsystem operably connected to said Internet database serving subsystem.

21. A method of finding and serving the home-page of the World Wide Web (WWW) site of a manufacturer of a particular consumer product, said method comprising the steps of:

(a) storing a set of information in an Internet database serving subsystem operably connected to the infrastructure of the Internet,

said set of information being representative of

(i) a plurality of manufacturer identification numbers (MINs) assigned to a plurality of manufacturers of consumer products, each said MIN being assigned to one of said plurality of manufacturers of consumer products, and

(ii) a plurality of home-page specifying URLs symbolically linked to said plurality of MINs, each said home-page specifying URL being symbolically linked to one of said plurality of manufacturers of consumer products and specifying the location of a manufacturer World Wide Web (WWW) site located on the Internet, having a home page, and being related to one of said plurality of manufacturers of consumer products;

(b) transmitting to said Internet database serving subsystem, a request made by a client subsystem operably connected to the Internet, for product-related information on the Internet about one of said plurality of consumer products, said request including information representative of the UPN assigned to a particular consumer product on which product-related information located on the Internet is being sought by a consumer using said client subsystem;

(c) said Internet database serving subsystem receiving said request and automatically comparing the UPN included in said request against said plurality of MINs stored in said information storage subsystem, and automatically returning to said client subsystem, the home-page specifying URL symbolically linked to the MIN contained within the UPN included in said request; and

(d) said client subsystem using the home-page specifying URL returned during step (c) to access the home-page of the WWW site of the manufacturer symbolically linked to the MIN contained within the UPN included in said request.

22. The method according to claim **21**, wherein said home-page specifying URL returned during step (c) is automatically displayed on said client subsystem for accessing the home-page of the WWW site of the manufacturer symbolically linked to said MIN contained within the UPN included in said request.

23. The method according to claim **21**, wherein one or more of the home-pages of said WWW sites comprise HTML-encoded documents located on the WWW.

24. The method according to claim **23**, wherein one or more of said home-page specifying URLs specify the location of said HTML-encoded documents on the WWW.

25. The method according to claim **21**, wherein said client subsystem is a WWW-enabled computer system selected from the group consisting of: a computer-based kiosk provided with a first WWW browser and a first bar code symbol reading device operably connected to said first WWW browser; a portable computer provided with a second WWW browser and a second bar code symbol reading device operably connected to said second WWW browser; and a desktop computer system provided with a third WWW browser and a third bar code symbol reading device operably connected to said third WWW browser.

26. The method according to claim **21**, wherein said UPN is a UPC.

27. The method of claim **21**, wherein said Internet database serving subsystem comprises an Internet information server and a relational database subsystem operably connected to said Internet database serving subsystem.

* * * * *

US006394354B1

(12) **United States Patent**
Wilz, Sr. et al.

(10) **Patent No.: US 6,394,354 B1**
(45) **Date of Patent: *May 28, 2002**

(54) **INTERNET-BASED SYSTEM AND METHOD FOR ROUTING, TRACKING AND DELIVERING PACKAGES USING URL-ENCODED BAR CODE SYMBOLS**

(75) Inventors: **David M. Wilz, Sr.**, Sewell; **Carl Harry Knowles**, Morristown, both of NJ (US)

(73) Assignee: **Metrologic Instruments, Inc.**, Blackwood, NJ (US)

(*) Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **09/228,223**

(22) Filed: **Jan. 11, 1999**

Related U.S. Application Data

(63) Continuation of application No. 08/846,219, filed on Apr. 25, 1997, now Pat. No. 6,076,733, which is a continuation-in-part of application No. 08/838,501, filed on Apr. 7, 1997, now Pat. No. 5,869,819, which is a continuation-in-part of application No. 08/820,540, filed on Mar. 19, 1997, now Pat. No. 6,068,188, which is a continuation-in-part of application No. 08/753,367, filed on Nov. 25, 1996, now abandoned, which is a continuation-in-part of application No. 08/645,331, filed on May 13, 1996, now Pat. No. 5,844,227, which is a continuation-in-part of application No. 08/615,054, filed on Mar. 12, 1996, which is a continuation-in-part of application No. 08/573,949, filed on Dec. 18, 1995, now abandoned, which is a continuation-in-part of application No. 08/292,237, filed on Aug. 17, 1994, now Pat. No. 5,808,285, which is a continuation-in-part of application No. 08/365,193, filed on Dec. 28, 1994, now Pat. No. 5,557,093, which is a continuation-in-part of application No. 08/293,493, filed on Aug. 19, 1994, now Pat. No. 5,525,789, which is a continuation-in-part of application No. 08/561,479, filed on Nov. 20, 1995, now Pat. No. 5,661,292, which is a continuation-in-part of application No. 08/278,109, filed on Nov. 24, 1993, now Pat. No. 5,484,992, which is a continuation-in-part of application No. 08/489,305, filed on Jun. 9, 1995, now abandoned, which is a continuation-in-part of application No. 08/476,069, filed on Jun. 7, 1995, now Pat. No. 5,591,953, which is a continuation-in-part of application No. 08/584,135, filed on Jan. 11, 1996, now Pat. No. 5,616,908.

(51) **Int. Cl.**[7] **G06K 7/10**

(52) **U.S. Cl.** **235/472.01**; 235/462.01; 235/375

(58) **Field of Search** 235/462.01, 472.01, 235/375, 384, 381

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,869,819 A * 2/1999 Knowles et al. 235/375

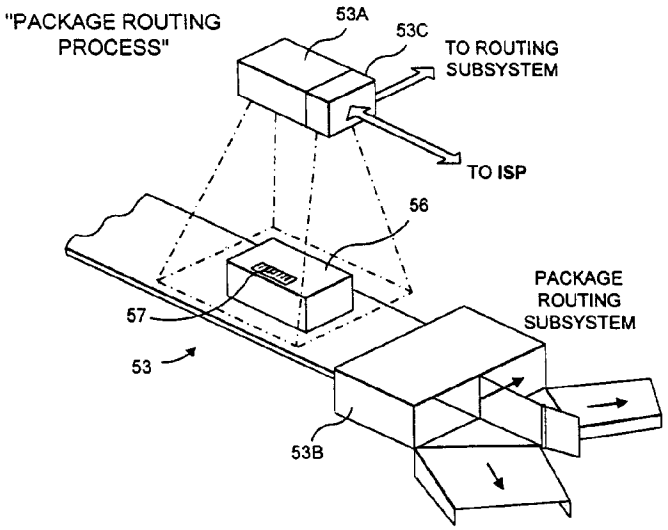
* cited by examiner

Primary Examiner—Thien M. Le
(74) *Attorney, Agent, or Firm*—Thomas J. Perkowski, Esq., P.C.

(57) **ABSTRACT**

An Internet-based system and method is provided for routing, tracking and delivering packages. Bar code symbols encoded with URLs and ZIP-CODE information are applied to packages to be routed and tracked within the system. At different points in the system, these URL/ZIP-CODE encoded bar code symbols are read to automatically route and track packages.

13 Claims, 19 Drawing Sheets



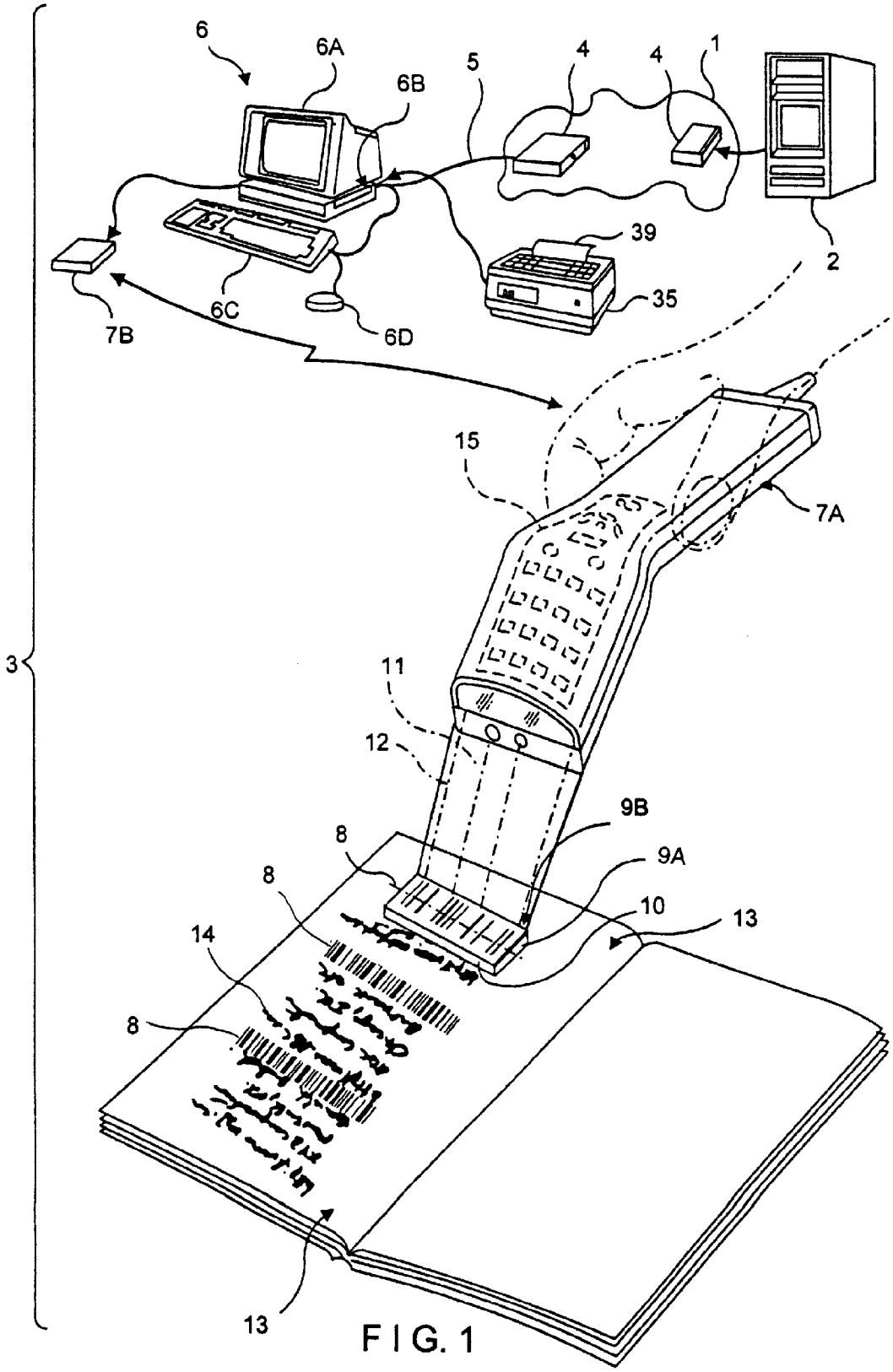


FIG. 1

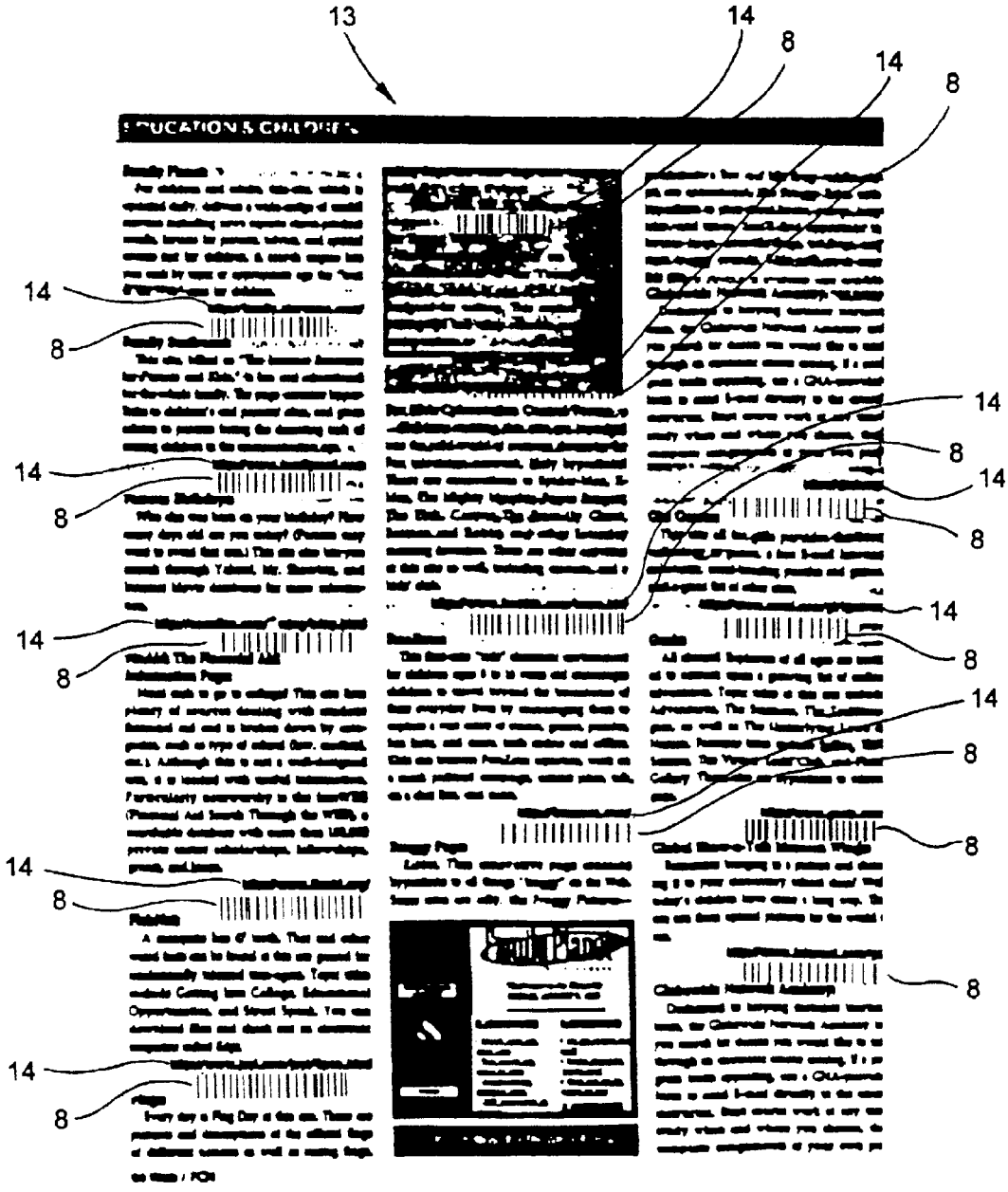
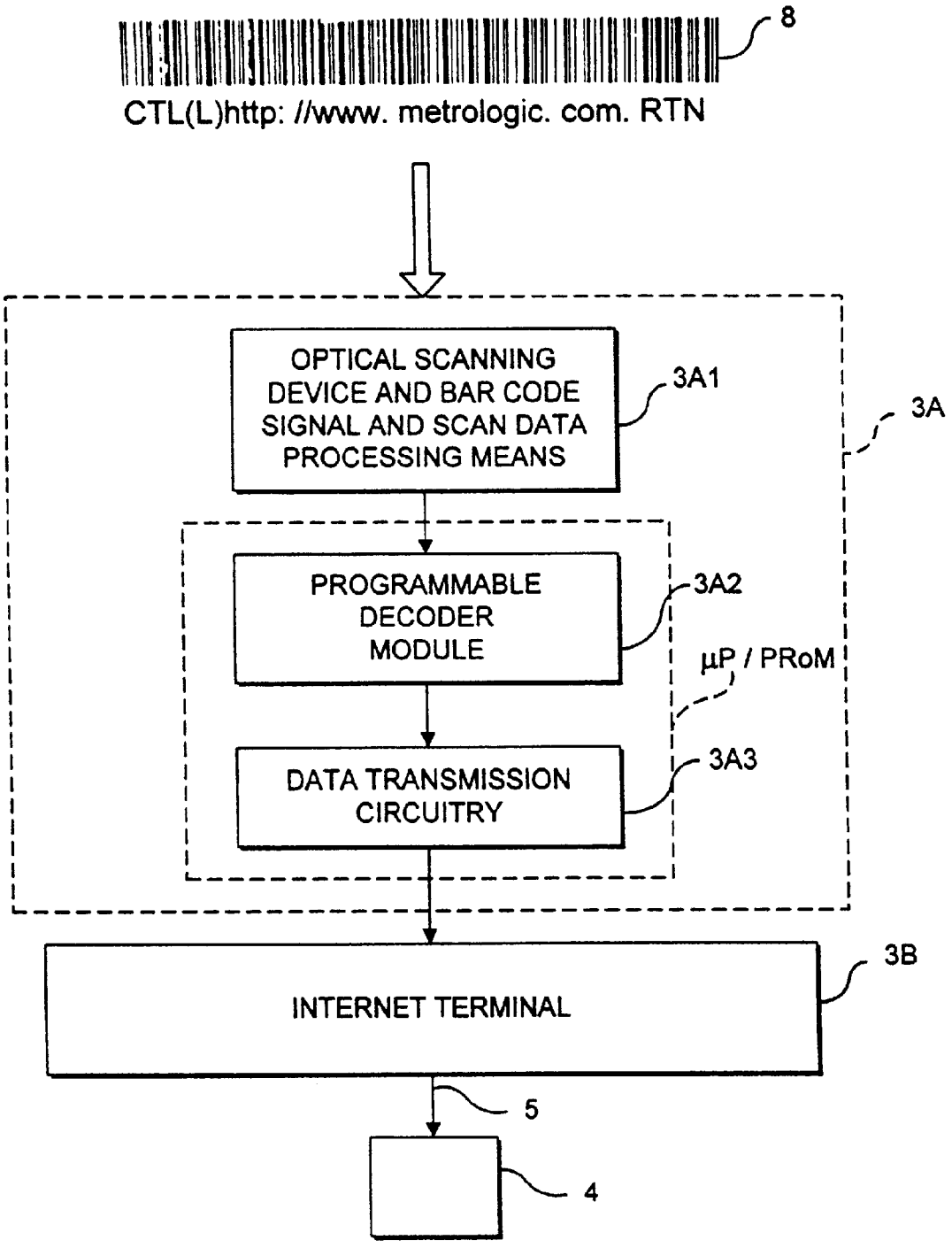
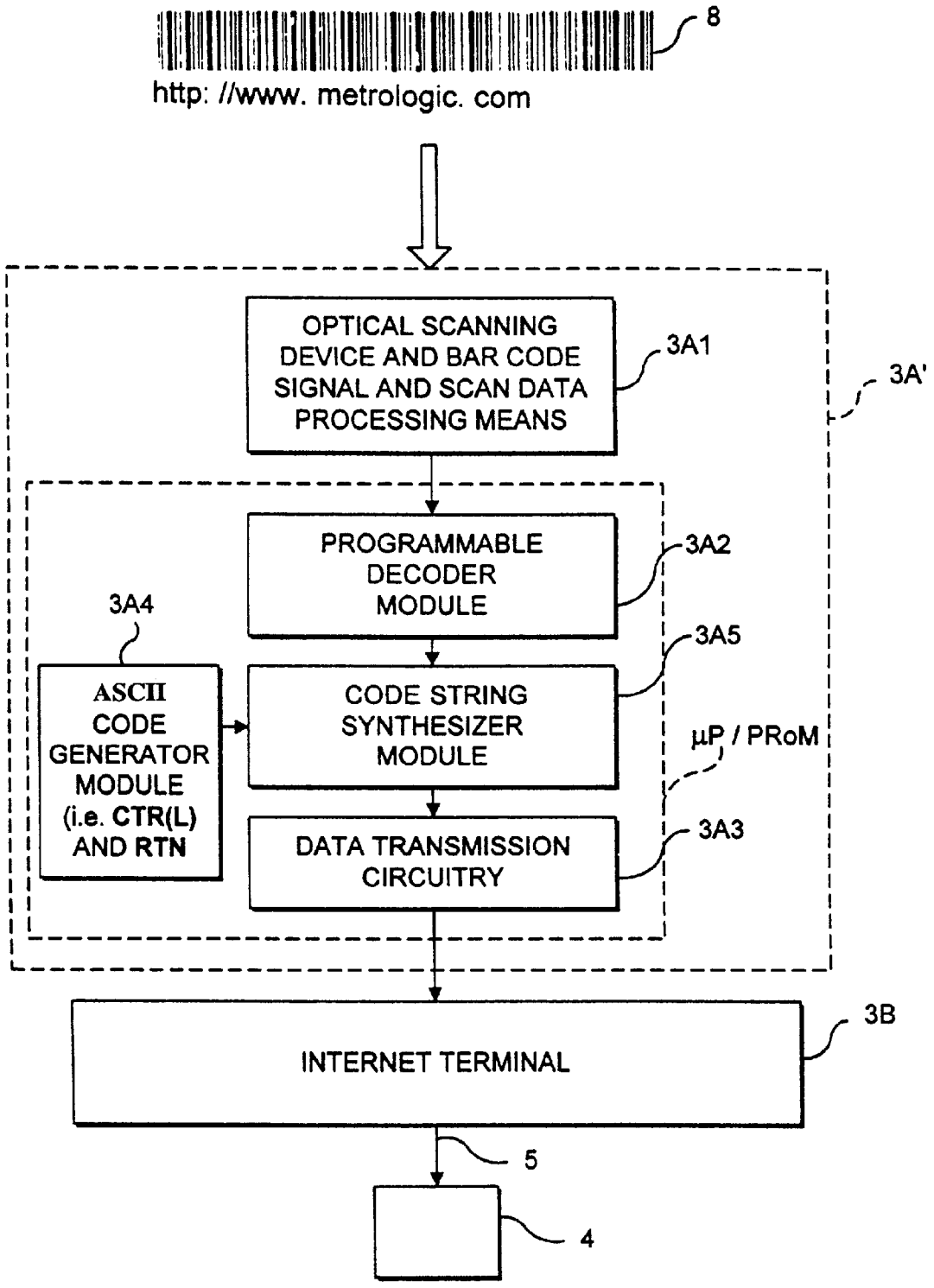


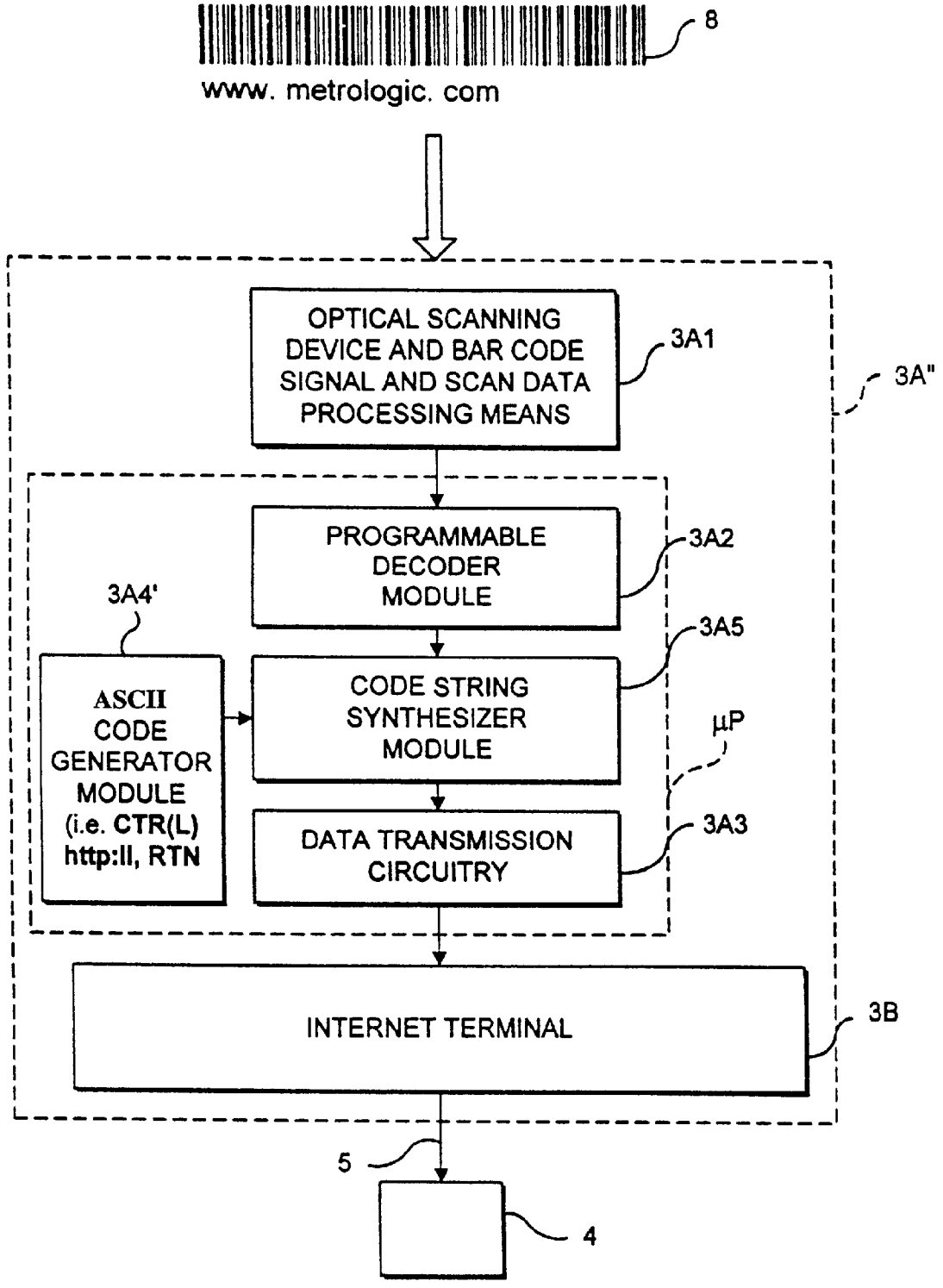
FIG. 1A


8
CTL(L)http: //www. metrologic. com. RTN
OPTICAL SCANNING DEVICE AND BAR CODE SIGNAL AND SCAN DATA PROCESSING MEANS
3A1
3A
PROGRAMMABLE DECODER MODULE
3A2
µP / PRoM
DATA TRANSMISSION CIRCUITRY
3A3
INTERNET TERMINAL
3B
5
4

F I G. 1B1


8
http: //www. metrologic. com
OPTICAL SCANNING DEVICE AND BAR CODE SIGNAL AND SCAN DATA PROCESSING MEANS
3A1
3A'
PROGRAMMABLE DECODER MODULE
3A2
3A4
3A5
ASCII CODE GENERATOR MODULE (i.e. CTR(L) AND RTN
CODE STRING SYNTHESIZER MODULE
µP / PRoM
DATA TRANSMISSION CIRCUITRY
3A3
INTERNET TERMINAL
3B
5
4

F I G. 1B2


8
www. metrologic. com
OPTICAL SCANNING DEVICE AND BAR CODE SIGNAL AND SCAN DATA PROCESSING MEANS
3A1
3A"
PROGRAMMABLE DECODER MODULE
3A2
3A4'
3A5
ASCII CODE GENERATOR MODULE (i.e. CTR(L) http:ll, RTN
CODE STRING SYNTHESIZER MODULE
µP
DATA TRANSMISSION CIRCUITRY
3A3
INTERNET TERMINAL
3B
5
4

F I G. 1B3

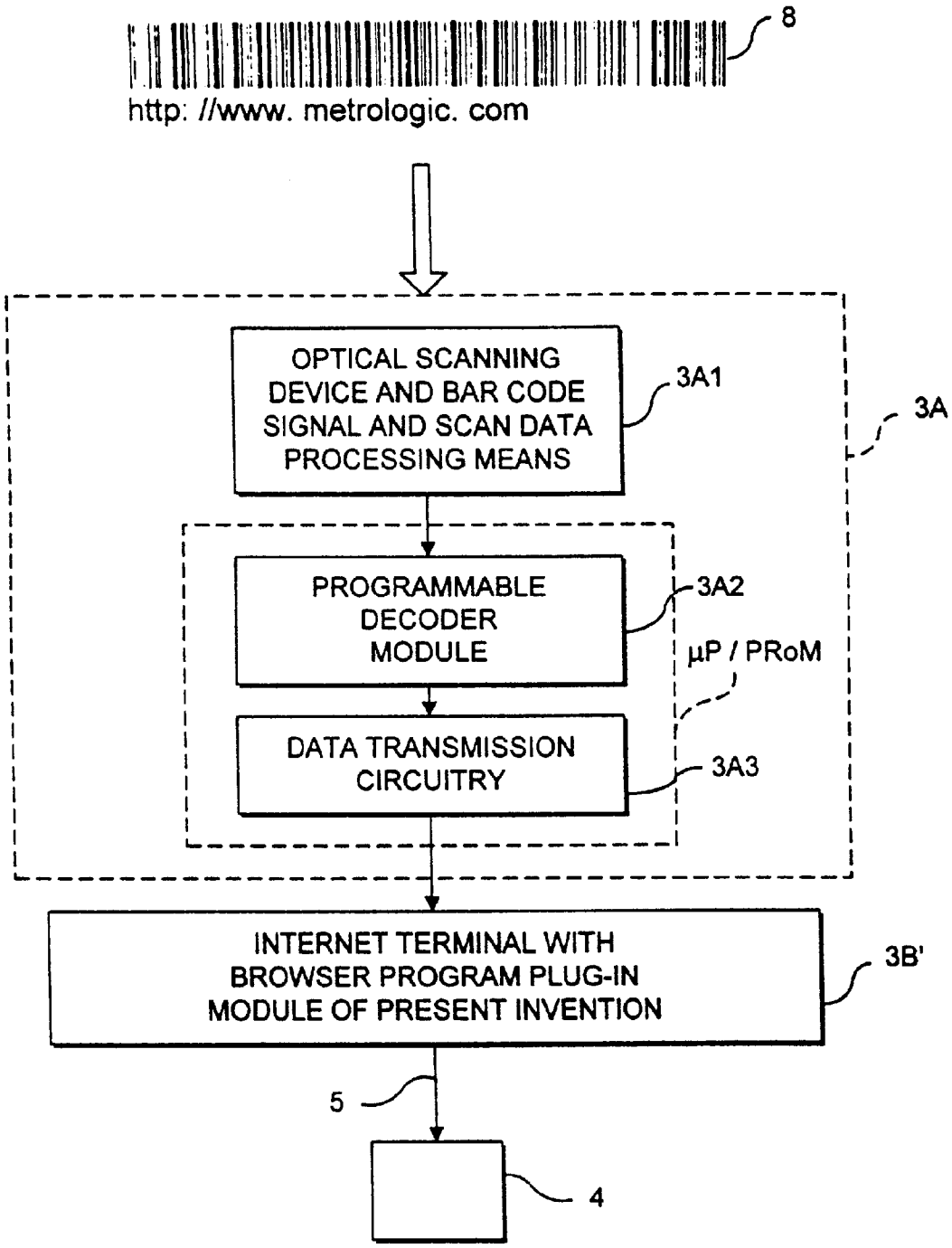

8
http: //www. metrologic. com
OPTICAL SCANNING DEVICE AND BAR CODE SIGNAL AND SCAN DATA PROCESSING MEANS
3A1
3A
PROGRAMMABLE DECODER MODULE
3A2
µP / PRoM
DATA TRANSMISSION CIRCUITRY
3A3
INTERNET TERMINAL WITH BROWSER PROGRAM PLUG-IN MODULE OF PRESENT INVENTION
3B'
5
4

FIG. 1B4

CTL(L) http: //www. pepsi. com RTN

FIG. 1C1

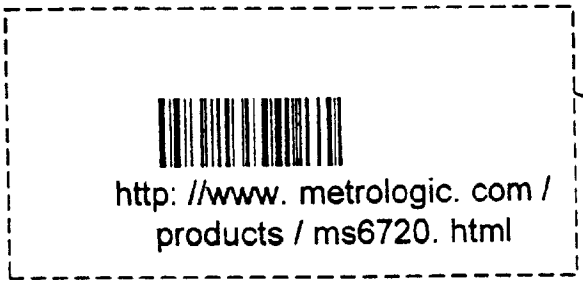
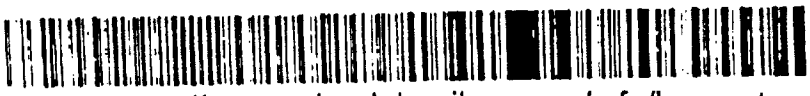


FIG. 1C2

CTL(L) http: //www. metrologic. com RTN

CTL(L)/products / ms6720. html RTN

FIG. 1D1



CTL(L) http: //www. clearlake. ibm. com/mfg/bocaraton

FIG. 1D2

CTL(L) http: //www. moore. com/labels/
(keyboard/bar coded characters)

FIG. 1E1

0CH 68H 74H 74H 3AH 2FH 77H 77H 77H 2EH 6DH 6FH 72H 63H 6FH 6DH 61H62H 65H 6CH 73H 2FH Hex signifies hexidecimal and is not transmitted

FIG. 1E2

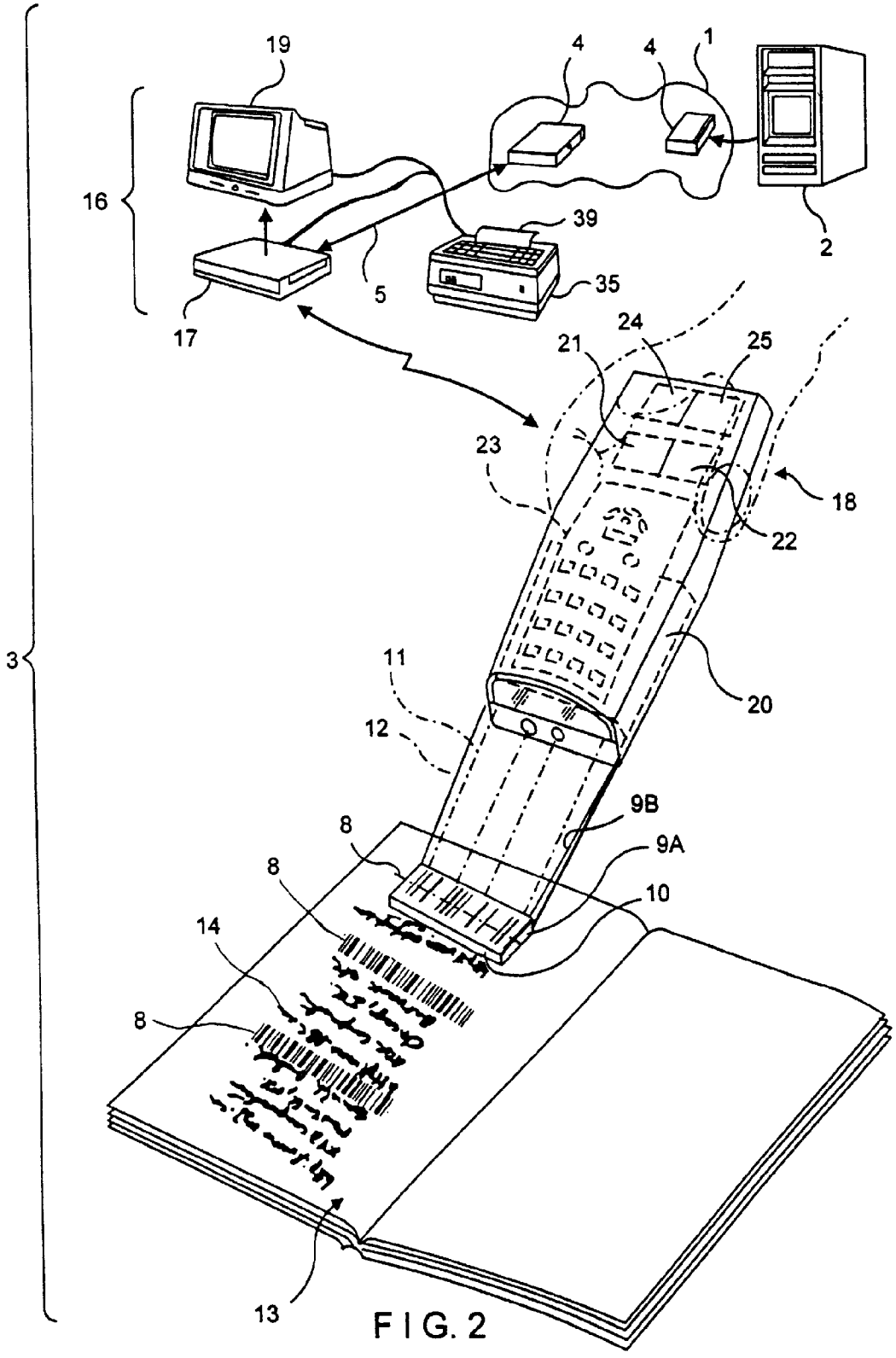


FIG. 2

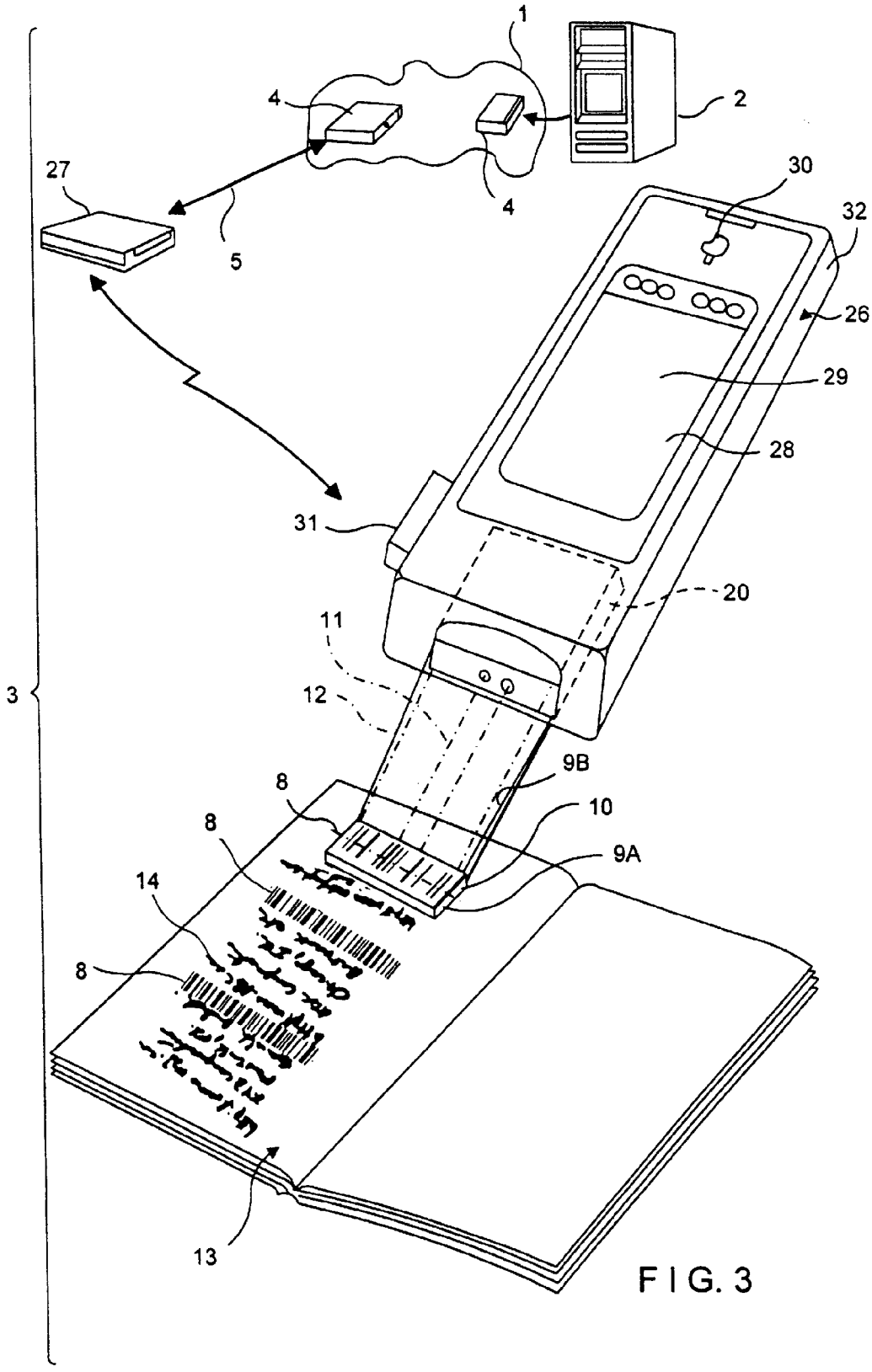


FIG. 3

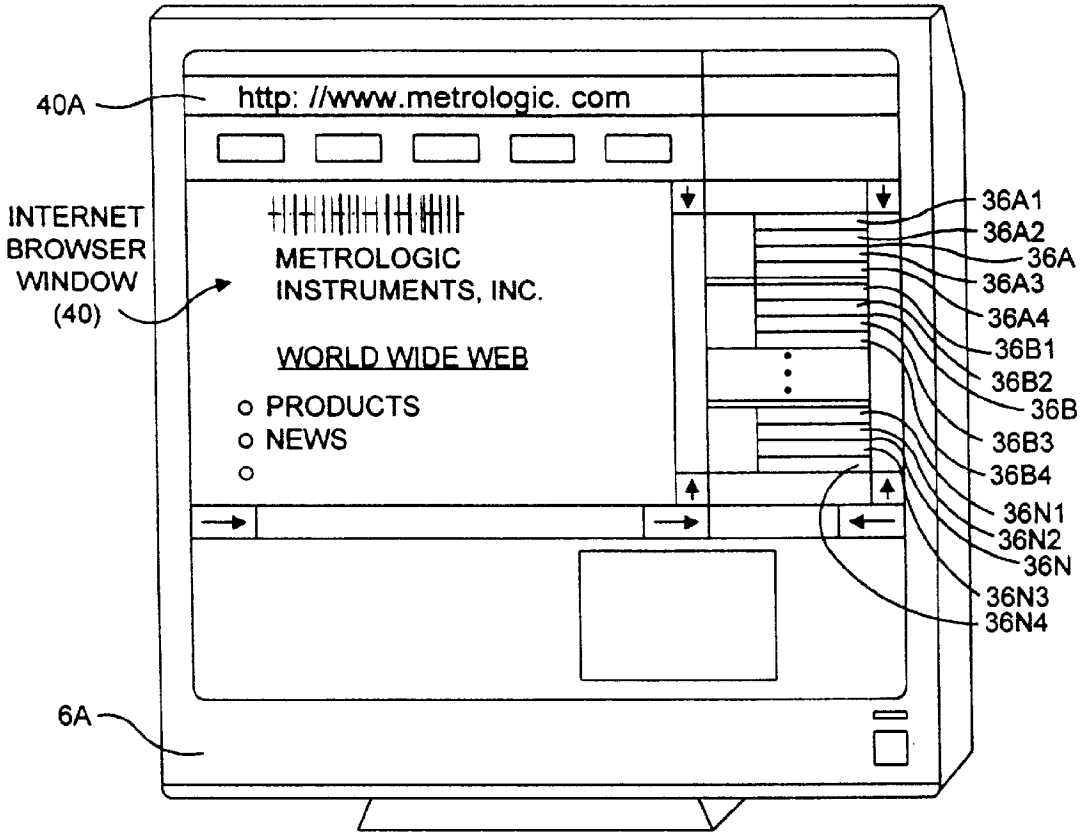

40A
http: //www.metrologic. com
INTERNET BROWSER WINDOW (40)
METROLOGIC INSTRUMENTS, INC.
WORLD WIDE WEB
o PRODUCTS
o NEWS
o
36A1
36A2
36A
36A3
36A4
36B1
36B2
36B
36B3
36B4
36N1
36N2
36N
36N3
36N4
6A

FIG. 4

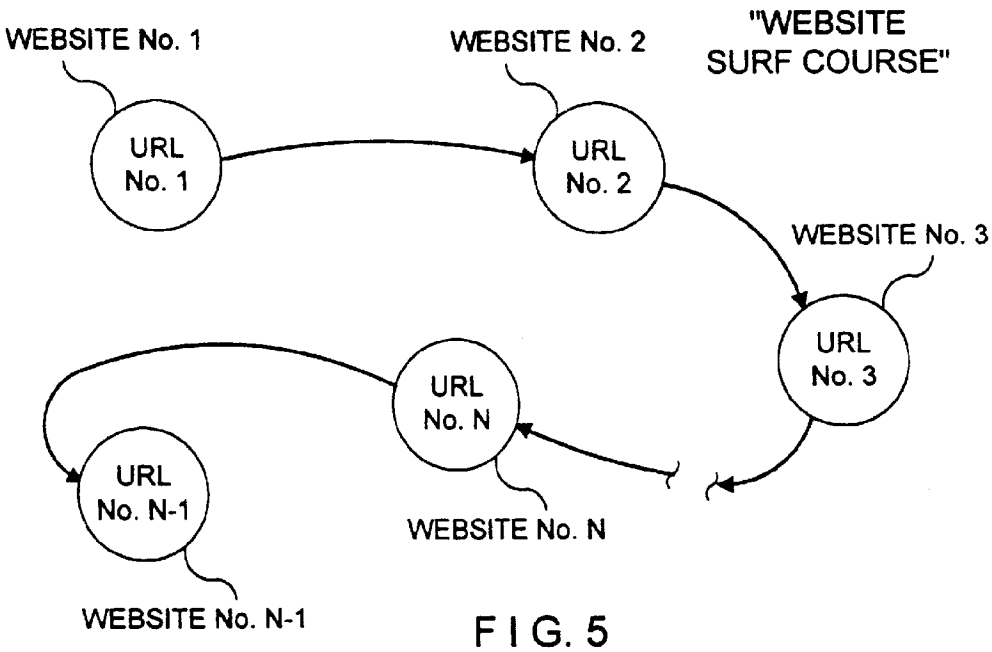

WEBSITE No. 1
WEBSITE No. 2
"WEBSITE SURF COURSE"
URL No. 1
URL No. 2
WEBSITE No. 3
URL No. 3
URL No. N
URL No. N-1
WEBSITE No. N
WEBSITE No. N-1

FIG. 5

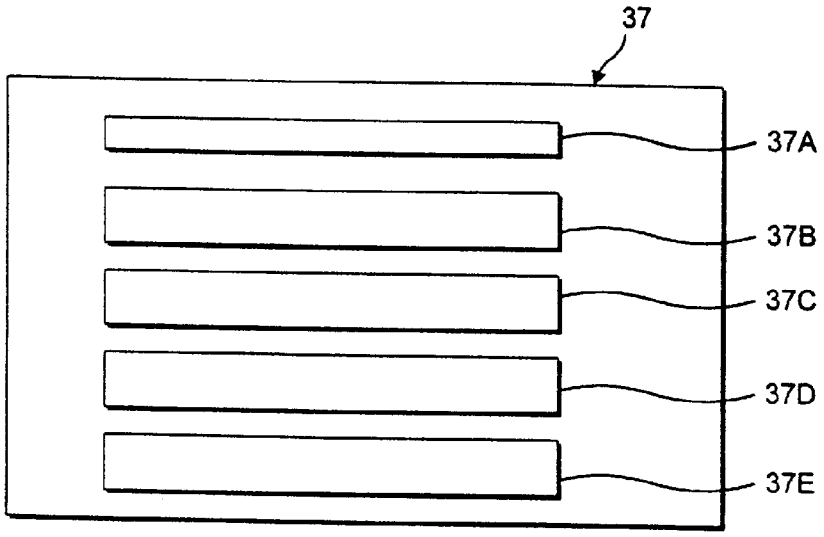

37
37A
37B
37C
37D
37E

FIG. 6A

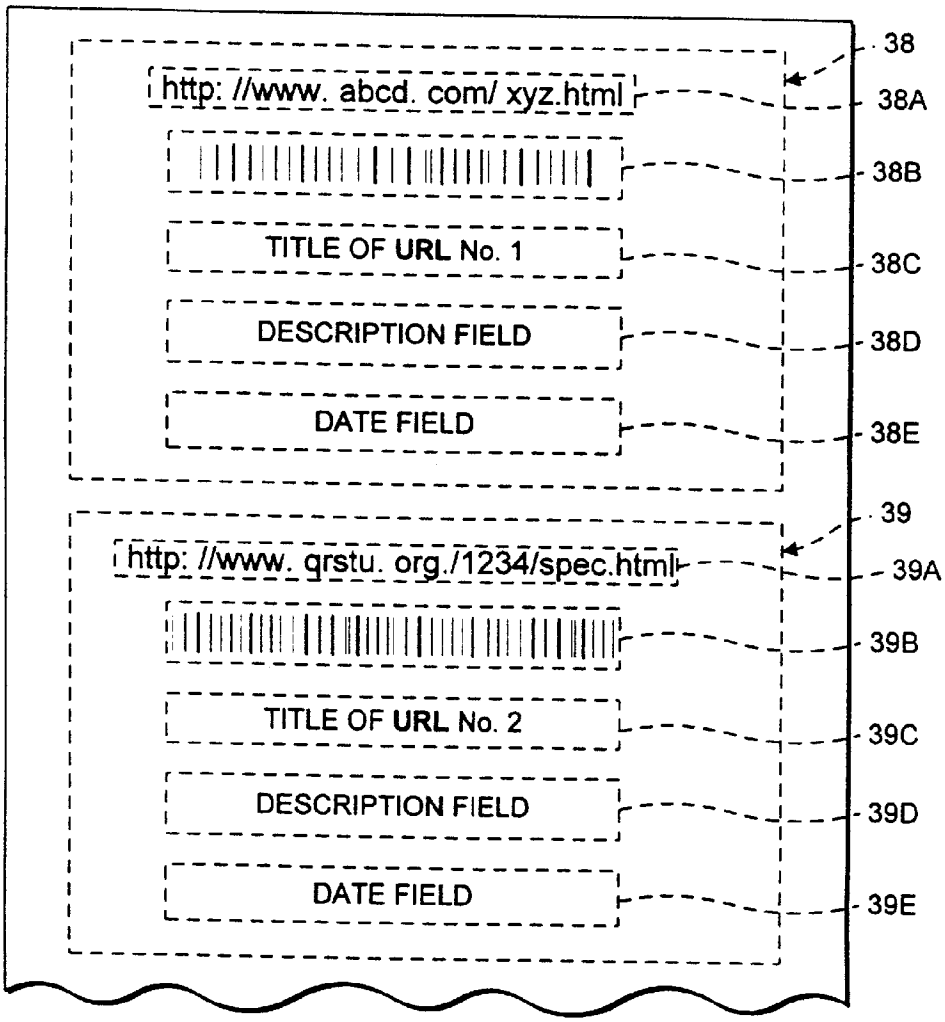

38
http: //www. abcd. com/ xyz.html
38A
38B
TITLE OF URL No. 1
38C
DESCRIPTION FIELD
38D
DATE FIELD
38E
39
http: //www. qrstu. org./1234/spec.html
39A
39B
TITLE OF URL No. 2
39C
DESCRIPTION FIELD
39D
DATE FIELD
39E

FIG. 6B

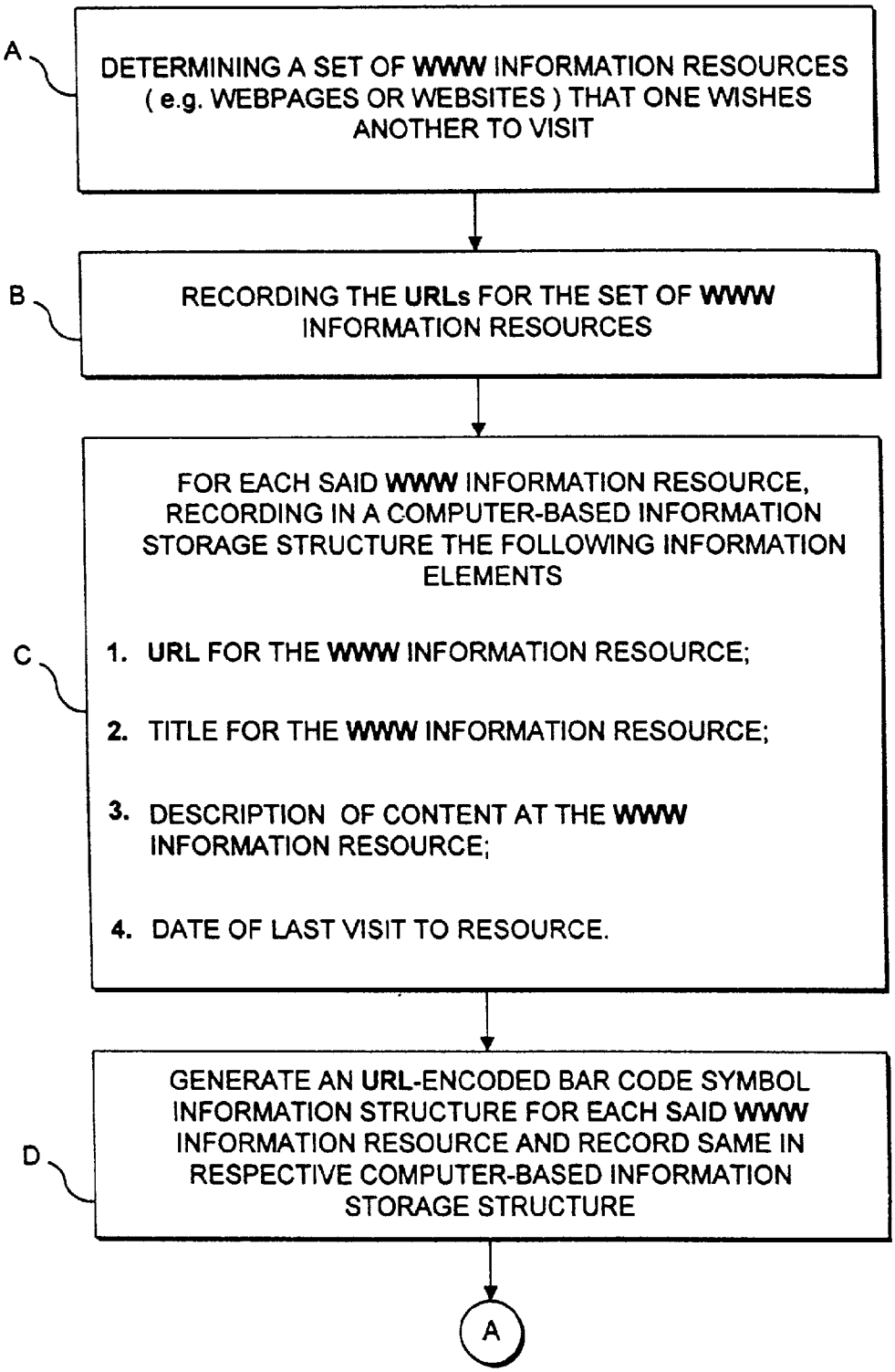

A
DETERMINING A SET OF WWW INFORMATION RESOURCES (e.g. WEBPAGES OR WEBSITES) THAT ONE WISHES ANOTHER TO VISIT
B
RECORDING THE URLs FOR THE SET OF WWW INFORMATION RESOURCES
C
FOR EACH SAID WWW INFORMATION RESOURCE, RECORDING IN A COMPUTER-BASED INFORMATION STORAGE STRUCTURE THE FOLLOWING INFORMATION ELEMENTS
1. URL FOR THE WWW INFORMATION RESOURCE;
2. TITLE FOR THE WWW INFORMATION RESOURCE;
3. DESCRIPTION OF CONTENT AT THE WWW INFORMATION RESOURCE;
4. DATE OF LAST VISIT TO RESOURCE.
D
GENERATE AN URL-ENCODED BAR CODE SYMBOL INFORMATION STRUCTURE FOR EACH SAID WWW INFORMATION RESOURCE AND RECORD SAME IN RESPECTIVE COMPUTER-BASED INFORMATION STORAGE STRUCTURE
A

FIG. 7A

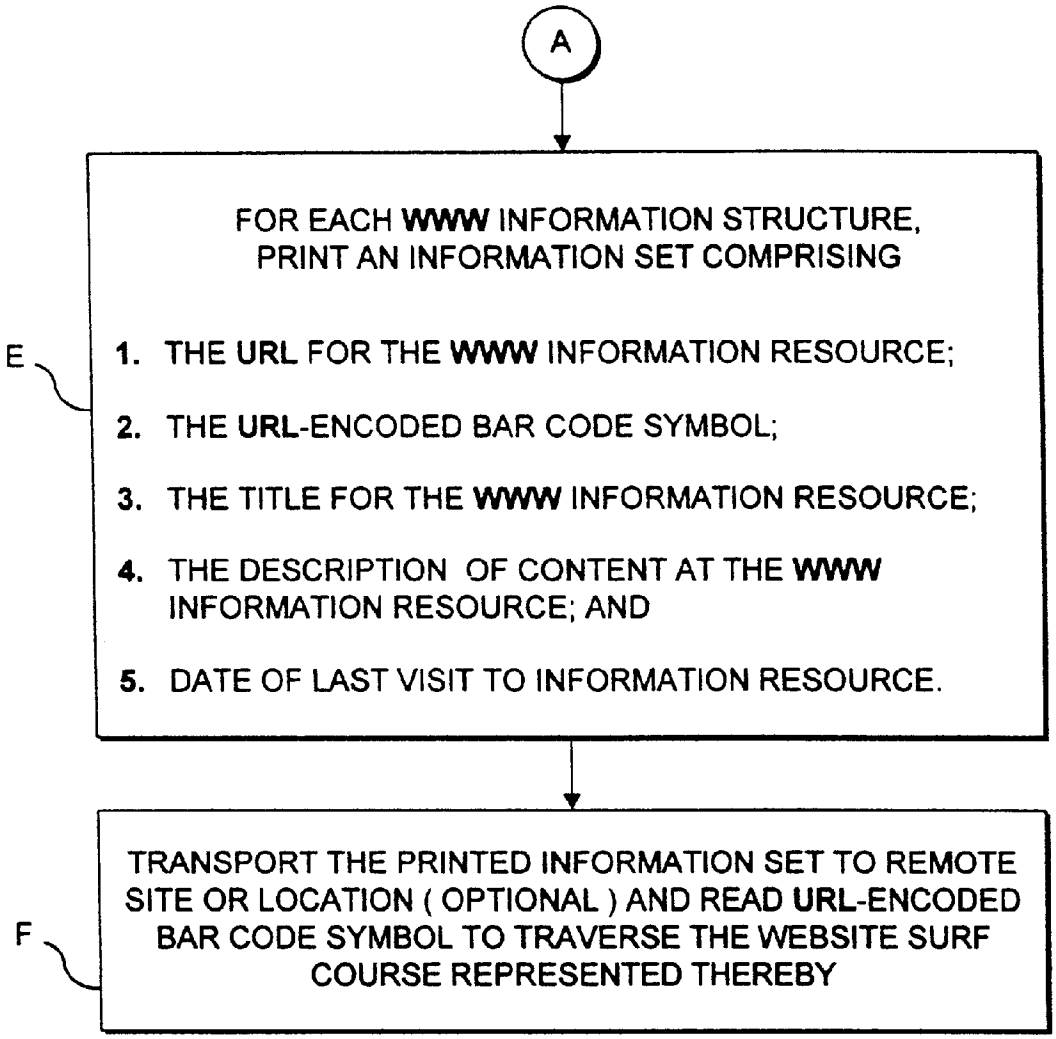

A
FOR EACH WWW INFORMATION STRUCTURE, PRINT AN INFORMATION SET COMPRISING
E
1. THE URL FOR THE WWW INFORMATION RESOURCE;
2. THE URL-ENCODED BAR CODE SYMBOL;
3. THE TITLE FOR THE WWW INFORMATION RESOURCE;
4. THE DESCRIPTION OF CONTENT AT THE WWW INFORMATION RESOURCE; AND
5. DATE OF LAST VISIT TO INFORMATION RESOURCE.
F
TRANSPORT THE PRINTED INFORMATION SET TO REMOTE SITE OR LOCATION (OPTIONAL) AND READ URL-ENCODED BAR CODE SYMBOL TO TRAVERSE THE WEBSITE SURF COURSE REPRESENTED THEREBY

FIG. 7B

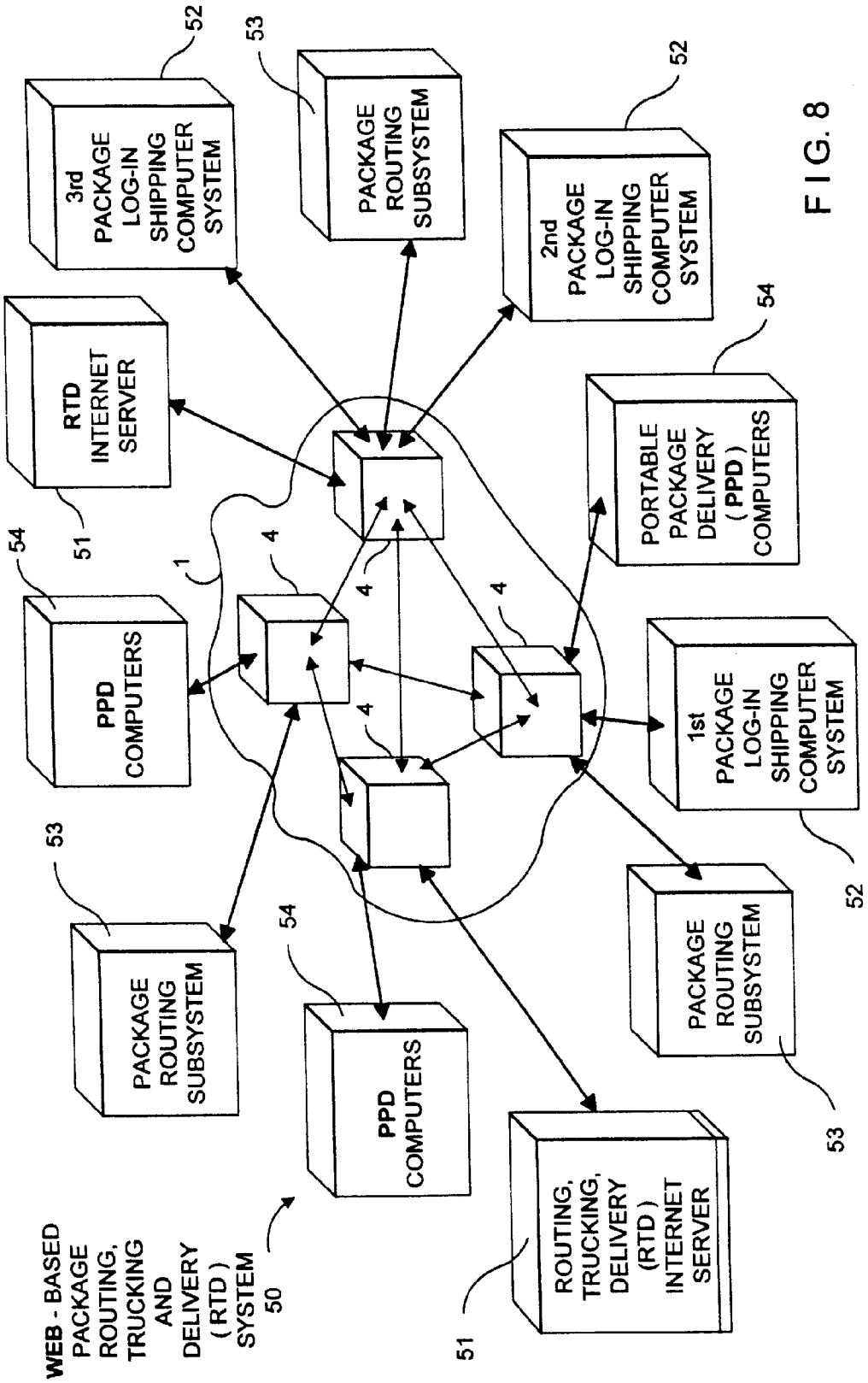

WEB - BASED PACKAGE ROUTING, TRUCKING AND DELIVERY (RTD) SYSTEM 50
ROUTING, TRUCKING, DELIVERY (RTD) INTERNET SERVER
51
PPD COMPUTERS
54
PACKAGE ROUTING SUBSYSTEM
53
1st PACKAGE LOG-IN SHIPPING COMPUTER SYSTEM
52
PORTABLE PACKAGE DELIVERY (PPD) COMPUTERS
54
2nd PACKAGE LOG-IN SHIPPING COMPUTER SYSTEM
52
PACKAGE ROUTING SUBSYSTEM
53
3rd PACKAGE LOG-IN SHIPPING COMPUTER SYSTEM
52
RTD INTERNET SERVER
51
PPD COMPUTERS
54
PACKAGE ROUTING SUBSYSTEM
53
1
4
4
4
4

FIG. 8

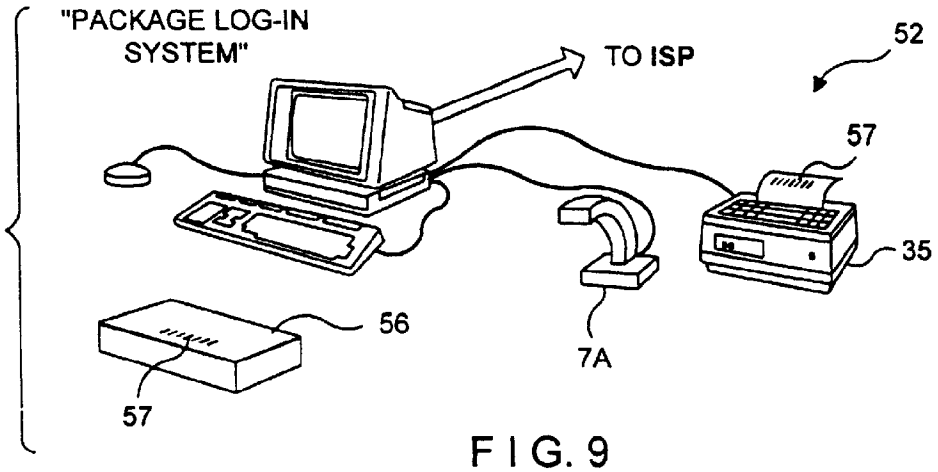


FIG. 9

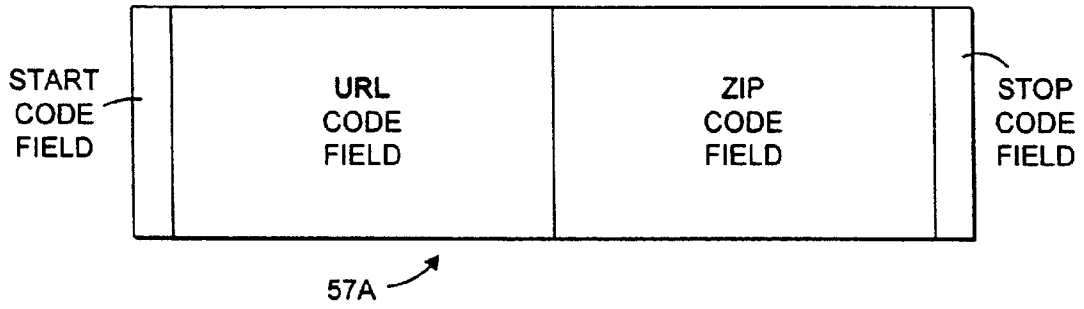


FIG. 10A

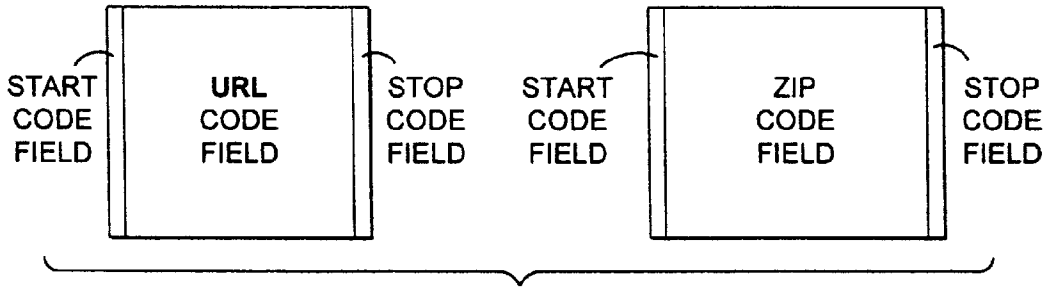


FIG. 10B

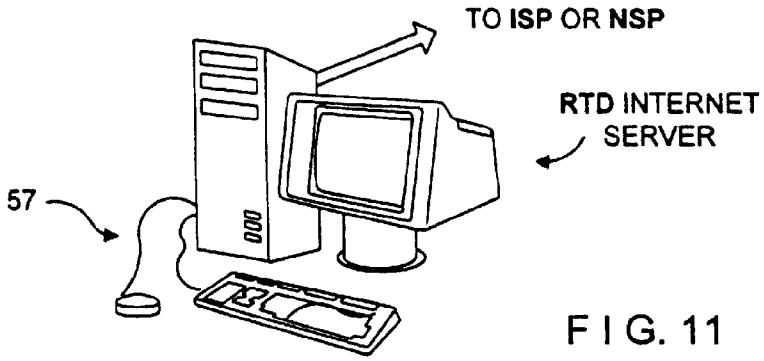


FIG. 11

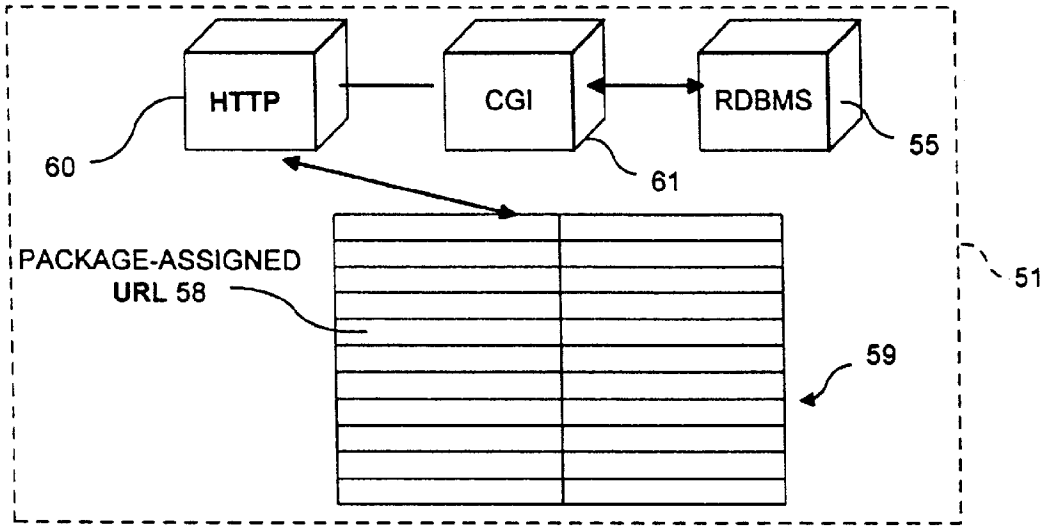


FIG. 11A

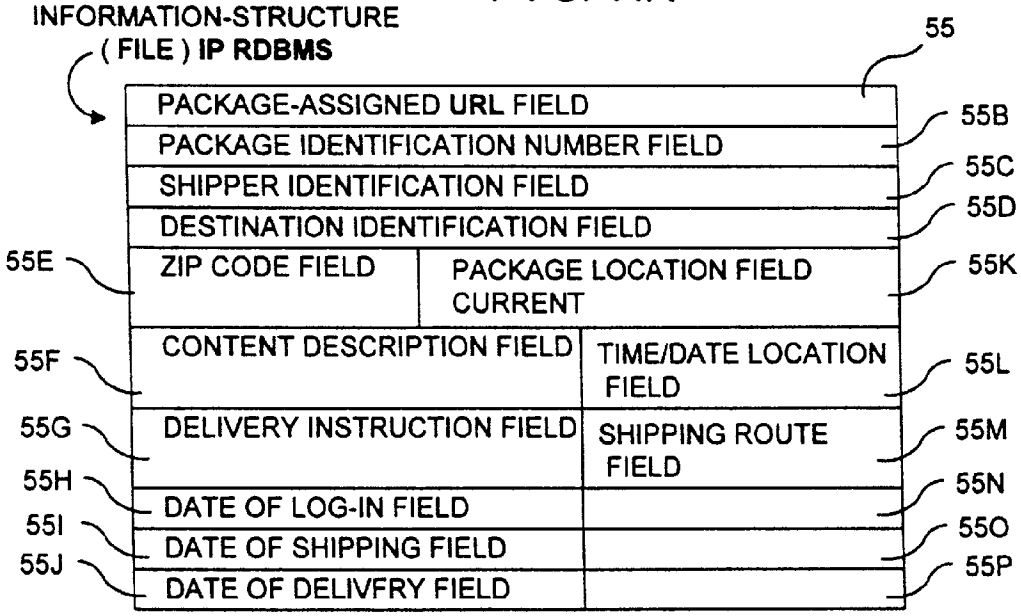
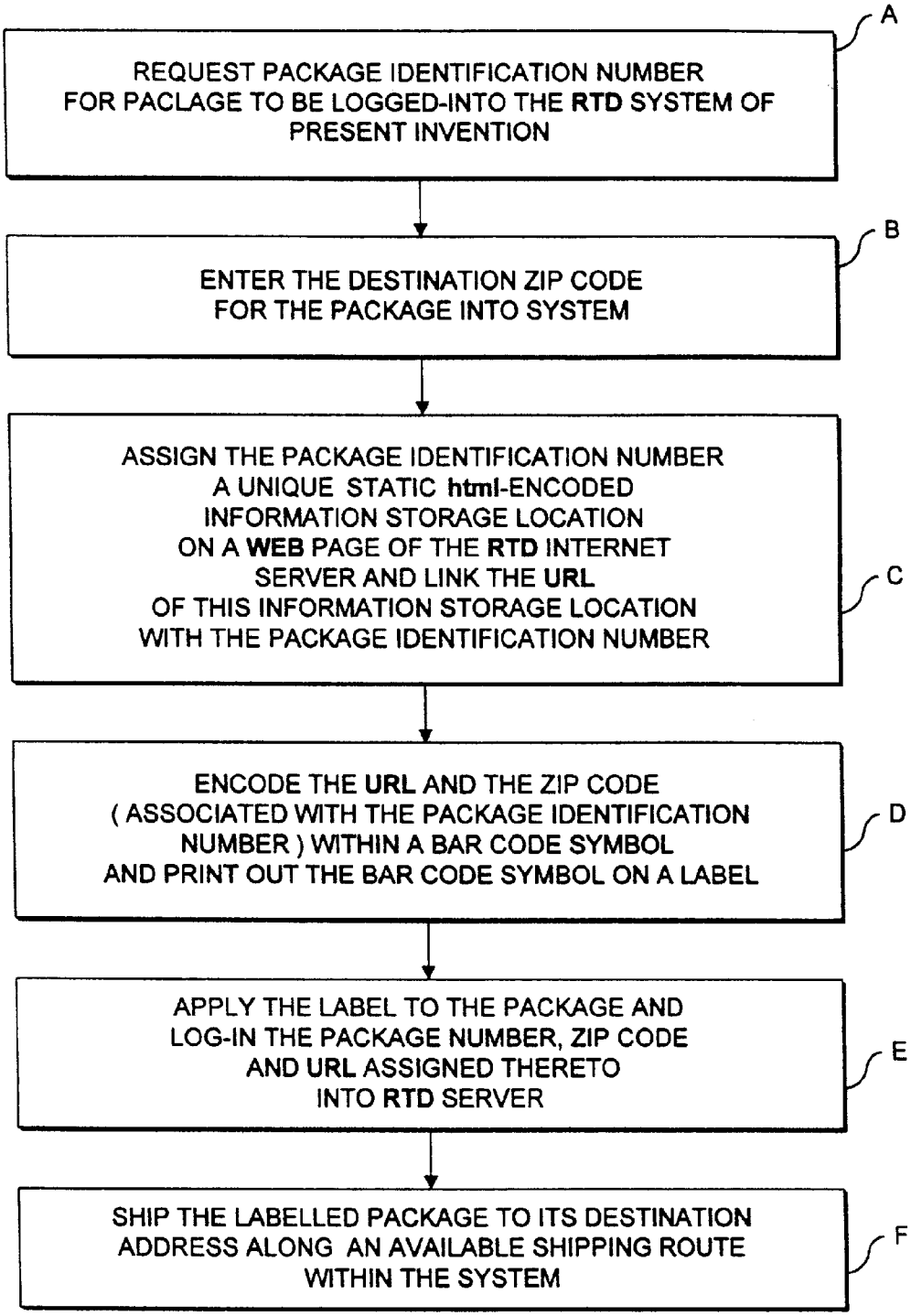


FIG. 11B



"PACKAGE LOG-IN PROCESS"

FIG. 12

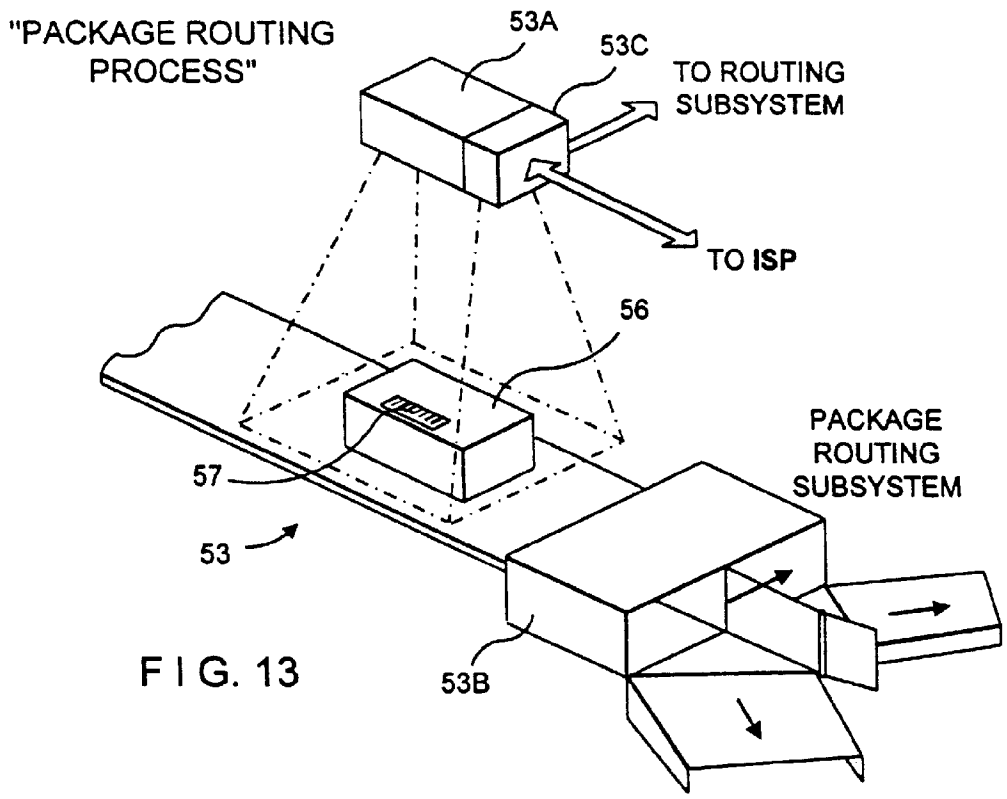

"PACKAGE ROUTING PROCESS"
53A
53C
TO ROUTING SUBSYSTEM
TO ISP
56
PACKAGE ROUTING SUBSYSTEM
57
53
53B

FIG. 13

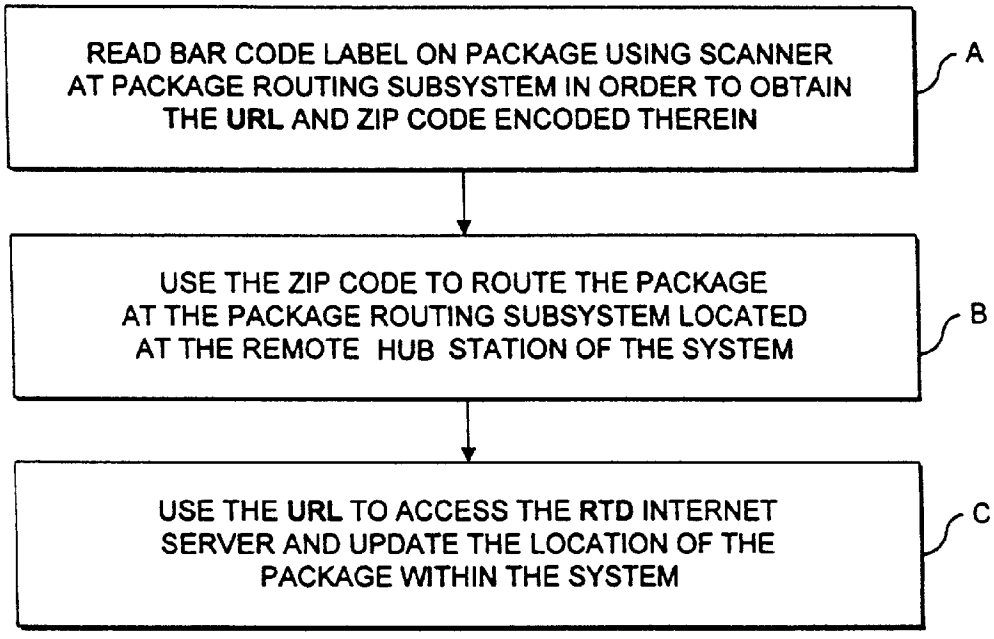

READ BAR CODE LABEL ON PACKAGE USING SCANNER AT PACKAGE ROUTING SUBSYSTEM IN ORDER TO OBTAIN THE URL AND ZIP CODE ENCODED THEREIN
A
USE THE ZIP CODE TO ROUTE THE PACKAGE AT THE PACKAGE ROUTING SUBSYSTEM LOCATED AT THE REMOTE HUB STATION OF THE SYSTEM
B
USE THE URL TO ACCESS THE RTD INTERNET SERVER AND UPDATE THE LOCATION OF THE PACKAGE WITHIN THE SYSTEM
C

FIG. 14

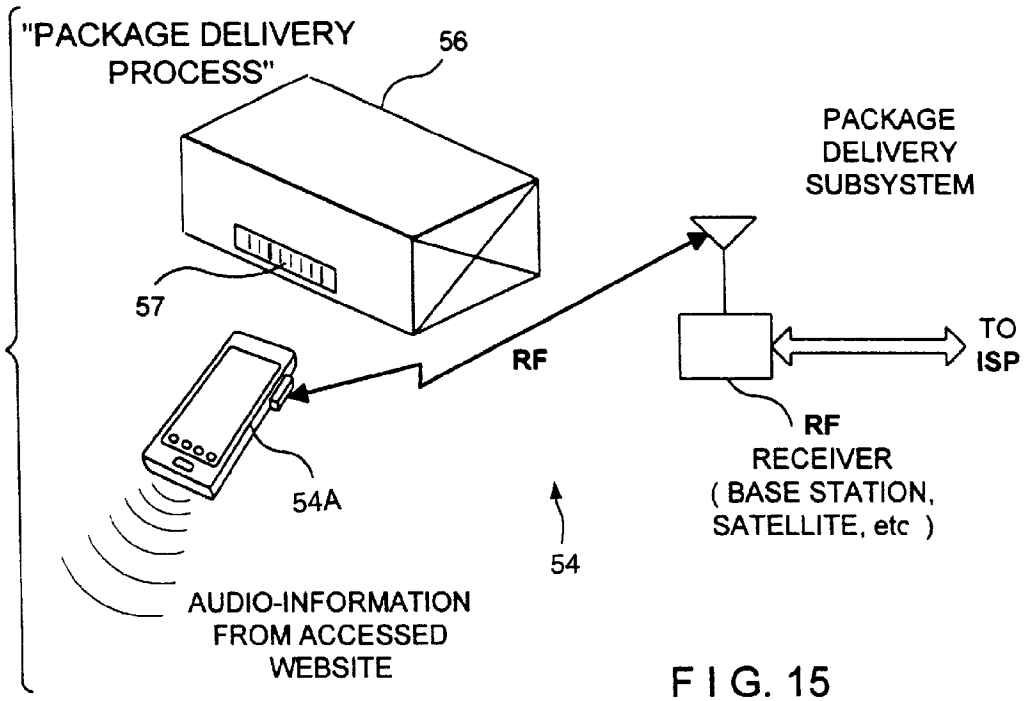

"PACKAGE DELIVERY PROCESS"
56
PACKAGE DELIVERY SUBSYSTEM
57
RF
TO ISP
RF RECEIVER (BASE STATION, SATELLITE, etc)
54A
54
AUDIO-INFORMATION FROM ACCESSED WEBSITE

FIG. 15

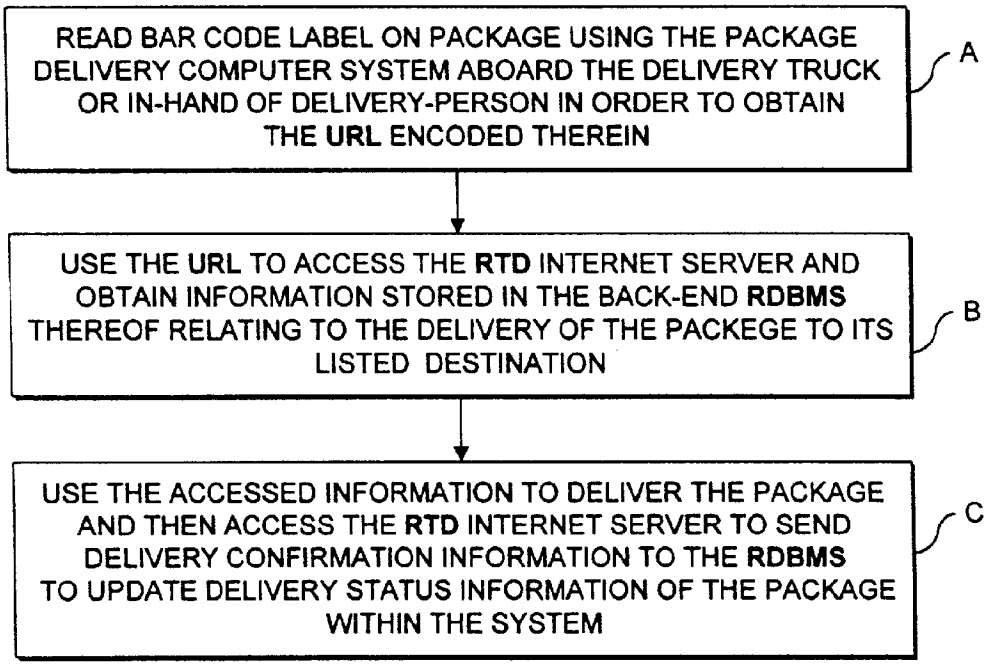

READ BAR CODE LABEL ON PACKAGE USING THE PACKAGE DELIVERY COMPUTER SYSTEM ABOARD THE DELIVERY TRUCK OR IN-HAND OF DELIVERY-PERSON IN ORDER TO OBTAIN THE URL ENCODED THEREIN
A
USE THE URL TO ACCESS THE RTD INTERNET SERVER AND OBTAIN INFORMATION STORED IN THE BACK-END RDBMS THEREOF RELATING TO THE DELIVERY OF THE PACKEGE TO ITS LISTED DESTINATION
B
USE THE ACCESSED INFORMATION TO DELIVER THE PACKAGE AND THEN ACCESS THE RTD INTERNET SERVER TO SEND DELIVERY CONFIRMATION INFORMATION TO THE RDBMS TO UPDATE DELIVERY STATUS INFORMATION OF THE PACKAGE WITHIN THE SYSTEM
C

FIG. 16

INTERNET-BASED SYSTEM AND METHOD FOR ROUTING, TRACKING AND DELIVERING PACKAGES USING URL-ENCODED BAR CODE SYMBOLS

RELATED CASES

This Application is a Continuation of application Ser. No. 08/846,219 filed Apr. 25, 1997 now 6,076,733, which is a Continuation-in-part of: application Ser. No. 08/838,501 entitled "Internet-Based System And Method For Tracking Objects Bearing URL-Encoded Bar Code Symbols" by David M. Wilz, Sr. and C. Harry Knowles, filed Apr. 7, 1997 now 5,865,819, which is a Continuation-in-Part of application Ser. No. 08/820,540 entitled "System And Method For Composing And Printing URL-encoded bar code symbol Lists And Menus For Use In Visiting Internet-Based Information Resources By Scanning The Same" by Harry Knowles, filed Mar. 19, 1997 now 6,068,188, which is a Continuation-in-part of application Ser. No. 08/753,367 filed Nov. 25, 1996 now abandoned; application Ser. No. 08/645,331 filed May 13, 1996 now U.S. Pat. No. 5,844,227; application Ser. No. 08/615,054 filed Mar. 12, 1996 now 6,286,760; application Ser. No. 08/573,949 filed Dec. 18, 1995 now abandoned; application Ser. No. 08/292,237 filed Aug. 17, 1994 now U.S. Pat. No. 5,808,285; application Ser. No. 08/365,193 filed Dec. 28, 1994 now U.S. Pat. No. 5,557,093; application Ser. No. 08/293,493 filed Aug. 19, 1994 now U.S. Pat. No. 5,525,789; application Ser. No. 08/561,479 filed Nov. 20, 1995 now U.S. Pat. No. 5,661,292; application Ser. No. 08/278,109 filed Nov. 24, 1993 now U.S. Pat. No. 5,484,992; application Ser. No. 08/489,305 filed Jun. 9, 1995 now abandoned; Ser. No. 08/476,069 filed Jun. 7, 1995 now U.S. Pat. No. 5,591,953; and application Ser. No. 08/584,135 filed Jan. 11, 1996 now U.S. Pat. No. 5,616,908. Each said patent application is assigned to and commonly owned by Metrologic Instruments, Inc. of Blackwood, N.J., and is incorporated herein by reference in its entirety.

BACKGROUND OF INVENTION

1. Field of Invention

The present invention is directed to a novel bar-code symbol driven Internet Access Terminal, and method of accessing Internet-based information resources by scanning bar code symbols encoded with Uniform Resource Locators (URLS) or Domain Name/Path Name (DN/PN) portions thereof indicating the location of such information resources on the Internet.

2. Background of the Invention

Presently, several techniques have been developed for connecting to or accessing (i.e., "surfing" among) Internet-based information resources on the World Wide Web (WWW) using conventional graphical user interface (GUI) based Internet browser programs, such as the Navigator® from Netscape Communications, Inc. or the Internet Explorer® from Microsoft, Inc. The availability of any particular Web-site surfing technique depends on where the Internet user finds him or, her self in the Internet browser program at any particular instant of time.

For example, if one is currently at a Web-site (i.e., in a particular HyperText Markup Language (HTML) document), at which there is a highlighted or embedded "link" specifying the Internet address of another Web-site (i.e., another HTML document), then the user can access (i.e., "surf to") this other Web-site by simply "clicking on" or selecting the highlighted URL with his or her pointing device (i.e., "mouse") in a conventional manner. The ability to connect to other Web-sites by simply pointing and clicking on highlighted URLs embedded in an HTML document has contributed enormously to the growth and popularity of the Internet in the last few years.

If the user desires to connect to a Web-site that is not referenced in a HTML document viewed through a browser program, then the user oftentimes finds it necessary to manually enter the URL of the Web-site (e.g., "http://www.metrologic.com") into the browser program. This requires manually pressing a sequence of keys on a keyboard or remote control device, corresponding to the characters of the URL being selected. In addition to being time consuming, this Web-site surfing technique is prone to errors, causing the browser program to connect to the wrong Web-site or return an error message stating that the Domain Name of the Web-site sought after cannot be found. From a practical point of view, this is quite frustrating to the Internet user.

More recently, with the growth and ever increasing complexity of the WWW, it is becoming popular to use printed publications (e.g., magazines, catalogues, directories, etc.) which list Websites, corresponding URLs and content descriptions as navigational aids, much in same way that the TV GUIDEO magazine is used to help viewers select programs during television viewing. Again, however, each time a listed Web-site is to be viewed, the user is forced to manually enter into the Internet browser program the lengthy character string associated with the URL of the Web-site being selected. Only thereafter does the browser program automatically connect the user's client system (i.e., Internet Terminal) to the Internet Server computer supporting the selected Web-site.

While the development of HTML and GUI-based Web browser programs have made accessing Web-sites relatively simple, the above shortcomings and drawbacks of prior art Internet technology clearly indicate a great need in the art for an improved system and method of accessing information resources on the Internet.

OBJECTS AND SUMMARY OF THE PRESENT INVENTION

Accordingly, it is a primary object of the present invention to provide an improved method and apparatus for accessing and navigating among information resources on the Internet, while avoiding the shortcomings and drawbacks of prior art systems and methodologies.

A further object of the present invention is to provide an Internet Access System which includes a bar code symbol reader for reading DN/PN-encoded (Domain Name and Path Name encoded) or URL-encoded (Uniform Resource Location encoded) bar code symbols printed on various types of objects, including print media, which, when read thereby, automatically connects the Internet Access System to the Internet Server that contains the information resource specified by the scanned DN/PN-encoded or URL-encoded bar code symbol.

A further object of the present invention is to provide such an Internet Access System, wherein the bar code symbol reader may be a laser scanning bar code symbol reader, a CCD-type bar code symbol, or a Wand-type bar code symbol reader.

A further object of the present invention is to provide such an Internet Access System, wherein the DN-encoded bar code symbol printed on various types of print media is a DN/PN-encoded truncated-type bar code symbol, having a

very low height to length ratio, thereby allowing many URL-encoded bar code symbols to be printed on a single sheet or page of a Web-site guide, along with their corresponding human-readable URLs and content descriptions.

A further object of the present invention is to provide such an Internet Access System, wherein the URL-encoded bar code symbol printed on various types of print media is a URL-encoded truncated-type bar code symbol, having a very low height to length ratio, thereby allowing many URL-encoded bar code symbols to be printed on a single sheet or page of a Web-site guide, along with their corresponding human-readable URLs and content descriptions.

Another object of the present invention is to provide such an Internet Access System in the form of a desktop, laptop or palmtop computer system that is connected to the Internet by way of an Internet Service Provider (ISP), wherein the computer system has a GUI-based web browser program and a programmed bar code symbol scanner interfaced therewith for automatically surfing to information resources (e.g., Web-sites) listed in a Web-site guide by simply scanning corresponding URL-encoded bar code symbols printed on the pages thereof.

A further object of the present invention is to provide an Internet Access System in the form of an interactive web-based television system, wherein the web-based television system comprises an Internet terminal unit connected to the Internet by way of an ISP, an audio-visual display monitor for displaying graphical and audio information content of Web-sites, and a portable Internet surfing device having a wireless IR-based communication link to the Internet terminal unit and an integrated bar code symbol scanner for automatically surfing to (or among) Web-sites listed in a Web-site guide by simply scanning corresponding URL-encoded bar code symbols printed on the pages thereof.

A further object of the present invention is to provide such an Internet Access System in the form of a Scanner Integrated Terminal, wherein the Scanner Integrated Terminal is connectable to the Internet by way of a wireless (RF) link to an ISP, and has an integrated GUI-based web browser program, display panel, keypad, and programmed bar code symbol scanner for automatically surfing to Web-sites listed in a Web-site guide by simply scanning corresponding DN-encoded (or URL-encoded) bar code symbols printed on the pages thereof.

Another object of the present invention is to provide a novel method of surfing to Web-sites on the Internet by scanning URL-encoded bar code symbols into GUI-based web browser programs, without the need of manual data entry operations or the like.

A further object of the present invention is to provide an Internet Access System, which includes an optical character reader programmed to read the character strings of URLs printed on various types of print media which, when read thereby, automatically connects the Internet Client System to the Internet Server that supports the Web-site specified by the read URL.

Another object of the present invention is to provide such an Internet Access System in the form of a desktop, laptop or palmtop computer system that is connected to the Internet by way of an Internet Service Provider (ISP), wherein the computer system has a GUI-based web browser program and a programmed optical character reader interfaced therewith for automatically surfing to Web-sites listed in a Web-site guide by simply reading corresponding URLs printed on the pages thereof.

A further object of the present invention is to provide an Internet Access System in the form of an interactive web-based television system, wherein the web-based television system comprises an Internet terminal unit connected to the Internet by way of an ISP, an audio-visual (AV) display monitor for displaying graphical and audio information content of Web-sites, and a portable Internet surfing device having a wireless IR-based communication link to the Internet Terminal unit and an integrated optical character reader for automatically surfing to Web-sites listed in a Web-site guide by simply scanning corresponding URLs printed on the pages thereof.

A further object of the present invention is to provide such an Internet Access System in the form of a Scanner Integrated Terminal, wherein the Scanner Integrated Terminal is connectable to the Internet by way of a wireless (RF) link to an ISP, and has an integrated GUI-based web browser program, display panel, keypad, and programmed optical character reader for automatically surfing to Web-sites listed in a Web-site guide by simply scanning corresponding URLs printed on the pages thereof.

Another object of the present invention is to provide a novel method of surfing to Web-sites on the Internet by optically scanning the character strings of URLs into GUI-based web browser programs, without the need of manual data entry operations and the like.

Another object of the present invention is to provide a novel system and method for printing URL-encoded bar code symbols on various types of print media which, when read thereby, automatically connects the Internet Client System to the Internet Server that supports the Web-site specified by the scanned URL-encoded bar code symbol.

Another object of the present invention is to provide such a system in the form of a suitably programmed desktop Web-linked computer workstation or laptop computer system having a graphical user interface and an Internet browser program having a plug-in type URL-Menu Composition/Printing Module that supports the bar code menu composition, transmission and printing processes of the present invention.

A further object of the present invention is to provide such a system, in which the Internet browser program and plug-in URL-Menu Composition/Printing Module allow the user to easily compile the following information structure during operation of the Internet browser program: a list of human-readable URLs corresponding to a set or course of information serving Web-sites, a set of URL-encoded bar code symbol data structures corresponding thereto, a set of titles assigned to the URLs, a set of brief descriptions of content served at the Web-sites, and date or dates the set of Web-sites were last visited by the compiler for subsequent printing in the form of a menu.

A further object of the present invention is to provide such a system, in which the compiled information structure can be electronically transmitted to a remote site, by e-mail, facsimile transmission, or other protocol available over the Internet, and thereafter printed out using appropriate print-driver software, so that the Web-sites listed in the compiled information structure can be easily visited by reading the corresponding URL-encoded bar code symbol into the Internet browser program using a bar code scanner.

Another object of the present invention is to provide a novel Web-site guide or directory comprising one or more sheets having a plurality of URL-encoded bar code symbols, corresponding human-readable URLs and Web-site content descriptions printed thereon.

Another object of the present invention is to provide a novel Web-based document tracking and management

system, in which each printed document (e.g., brochure, drawing, 3-D objects or specimens, photograph, specification, blue-print, and the like) to be tracked and managed within the system is uniquely assigned and affixed with a printed URL-encoded bar code symbol that specifies (i.e., points to) a particular information storage location within an IITML-encoded relational database management system (RDBMS), realized on a Web-based information server located on the Internet or behind the corporate firewall of an HTTP-supporting Intranet.

Another object of the present invention is to provide such a Web-based document tracking and management system, in which information relating to a document registered within the system can be easily accessed therefrom by simply scanning the printed URL-encoded bar code symbol on the document using the bar code symbol reader associated with an Internet Access Terminal (i.e., client computer system) of the present invention.

Another object of the present invention is to provide such a Web-based document tracking and management system, in which the Internet Access Terminal of each user can be used to: (1) assign a URL-encoded bar code symbol to any document to be registered with the system; (2) enter document-related information into the information storage location assigned to the document within the Web-based RDBMS; (3) print out URL-encoded bar code symbols for attachment to corresponding documents registered within the system; (4) modify at any time the document-related information currently stored in the information storage location assigned to the document within the Web-based RDBMS; and (5) access such document related information from the system by simply reading its corresponding URL-encoded bar code symbol.

Another object of the present invention to provide a Web-based package routing, tracking and delivering system and method that uses URL-encoded bar code symbols on parcels and packages.

A further object of the present invention is to provide such a Web-based package routing, tracking and delivery system and method, wherein one or more Routing, Tracking and Delivery (RTD) Internet Server Subsystems are connected to the Internet and updated at any instant of time with package related information produced by either (i) a Package Log-In/Shipping Subsystem that is located at a product shipping location (e.g., warehouse) and connected to the RTD Internet Server by a first data communication link, (ii) a Package Routing Subsystem that is located at a hub station and connected to the RTD Internet Server by a second data communication link, or (iii) a Portable Package Delivery Subsystem that is carried by the package delivery person and connected to the RTD Internet Server by a wireless data communication link.

A further object of the present invention is to provide such a Web-based package routing, tracking and delivery system and method, wherein at each remote hub station within the system: the URL/ZIP-CODE encoded bar code symbol is automatically scanned; the encoded destination Zip Code is locally recovered and used to route the package at the hub station; and the locally recovered URL is used to access the RTD Internet Server and update the location of the package within the system.

Another object of the present invention is to provide such a Web-based package routing, tracking and delivery system and method, wherein when the URL/ZIP-CODE Encoded bar code symbol is read by the deliveryman or courier using a portable (wireless) Internet Access Terminal, the recovered URL is used to automatically access the RTD Internet Server and display on the Internet Access Terminal, precise up-to-date parcel delivery information, payment-method terms, handling instructions and the like.

These and other Objects of the Present Invention will become apparent hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of how to practice the Objects of the Present Invention, the following Detailed Description of the Illustrative Embodiments should be read in conjunction with the accompanying Drawings, wherein:

FIG. **1** is a schematic diagram of the first preferred embodiment of the present invention, in which the Internet Access System hereof is realized in the form of a desktop computer system shown connected to the Internet by way of an ISP, and having a GUI-based web browser program and a bar code symbol scanner for automatically surfing to Web-sites listed in a Web-site guide by simply scanning corresponding URL-encoded bar code symbols printed on the pages thereof;

FIG. **1A** is a schematic representation of a single sheet or page of the Web-site Directory of the present invention, showing several URL-encoded (truncated) bar code symbols printed thereon along with their corresponding human-readable URLs and content descriptions;

FIG. **1B**(1) is a schematic diagram of a bar code-driven Internet Access System according to a first generalized embodiment of the present invention, shown reading a bar code symbol that has been encoded with (i) the program command that writes the URL into the information resource "Goto" window (i.e. "Goto" buffer) of the Internet browser program, (ii) the complete URL of an Internet information resource to be accessed, and (iii) the Internet browser program command that executes a Hyper-Text Transmission Protocol (HTTP) request on the URL entered into the "Goto" window;

FIG. **1B**(2)is a schematic diagram of a bar code-driven Internet Access System according to a second generalized embodiment of the present invention, for automatically (i) reading a bar code symbol that has been encoded with the complete URL of an Internet information resource to be accessed, and (ii) affixing thereto a prefix code string representative of the program command that writes the URL into the information resource "Goto" window of the Internet browser program, and a suffix code string representative of the program command that executes a HTTP request on the URL entered into the "Goto" window;

FIG. **1B**(3) is a schematic diagram of a bar code-driven Internet Access System according to a third generalized embodiment of the present invention, for automatically (i) reading a bar code symbol that has been encoded with only the Domain Name ((DN) or underlying IP address) and server Path Name portion of the URL of an Internet information resource to be accessed, (ii) affixing thereto prefix code strings representative of (1) the program command that writes the URL into the information resource "Goto" window of the Internet browser program and (2) the Internet protocol identifier (e.g., "http://"), and (iii) affixing thereto suffix code strings representative of the program command that executes an HTTP request on the URL entered into the "Goto" Window;

FIG. **1B**(4) is a schematic diagram of a bar code-driven Internet Access System according to a fourth generalized embodiment of the present invention for automatically (i) reading a bar code symbol that has been encoded with the

complete URL of an Internet information resource to be accessed, (ii) writing the URL into the information resource "Goto" window of the Internet browser program, and (iii) executing a HTTP request on the URL entered into the "Goto" window;

FIG. **1**C(1) is a graphical representation of an exemplary 1-D linear URL-encoded bar code symbol of the present invention, containing ASCII code elements representative of the complete URL of an Internet information resource to be accessed (e.g., http://www.pepsi.com) as well as the program command (e.g., CTL(L)) that writes the URL into the information resource "Goto" window of the Internet browser program and the program command (e.g., RTN) that executes an HTTP request on the URL entered into the "Goto" window;

FIG. **1**C(2) is a graphical representation of an exemplary 2-D URL-encoded bar code symbol of the PDF417 Symbology, encoded according to the principles of the present invention;

FIG. **1**D(1) is a graphical representation of an exemplary "multiple 1-D" URL-encoded bar code symbol structure according to the present invention, comprising a pair of discrete 1-D URL-encoded bar code symbols, wherein the first bar code symbol contains ASCII code elements representative of the program command (e.g., CTL(L)) that writes the URL into the information resource "Goto" window of the program, the complete URL of an Internet information resource to be accessed (e.g., http://www.metrologic.com), and the Internet browser program command (e.g., RTN) that executes a HTTP request on the URL entered into the "Goto" window, whereas the second bar code symbol contains ASCII code elements representative of the Internet browser program command (e.g., CTL(L)) that writes the URL into the information resource "Goto" window of the Internet browser program, the Path Name portion of the URL of the Internet information resource to be accessed (e.g., /Products/ms6720.html), and the program command (e.g., RTN) that executes an HTTP request on the URL entered into the "Goto" window;

FIG. **1**D(2) is a graphical representation of an exemplary 1-D URL-encoded bar code symbol of the present invention, containing ASCII code elements representative of the program command (e.g., CTL(L)) that writes the URL into the information resource "Goto" window of the Internet browser program, the complete URL of an Internet information resource to be accessed (e.g., http://www.clearlake.ibm.com) including the Path Name portion thereof (e.g., /Mfg/bocaraton), and the program command (e.g., RTN) that executes an HTTP request on the entered URL upon the reading of the bar code symbol;

FIG. **1**E(1) is a graphical representation of an exemplary 1-D URL-encoded bar code symbol of the present invention, containing ASCII code elements representative of the Internet browser program command (e.g., CTL(L)) that writes the URL into the information resource "Goto" window of the Internet browser program, the complete URL of an Internet information resource to be accessed (e.g., http://www.moore.com) including the Domain Name (e.g., moore.com) and Path Name portion thereof (e.g., //labels), and the Internet browser program command (e.g., RTN) that executes an HTTP request on the entered URL upon the reading of the bar code symbol;

FIG. **1**E(2) is a graphical representation of the hexidecimal number string corresponding to the exemplary 1-D URL-encoded bar code symbol of FIG. 1E(1) that is transmitted from the bar code symbol reader to the Internet browser program of the Internet Access System of the present invention;

FIG. **2** is a schematic diagram of the second preferred embodiment of the present invention, in which the Internet Access System hereof is realized in the form of an interactive web-based television system which comprises a Terminal Unit shown connected to the Internet by way of an ISP and has portable Internet Navigation (i.e., surfing) Device having an IR-link to the Terminal Unit, and a bar code symbol scanner integrated therewith for automatically accessing Web-sites listed in a Web-site guide by simply scanning corresponding URL-encoded bar code symbols printed on the pages thereof;

FIG. **3** is a schematic diagram of the third preferred embodiment of the present invention, in which the Internet Access System hereof is realized in the form of a hand-held Scanner Terminal shown connected to the Internet by way of a wireless link to an ISP, and having an integrated GUI-based web browser program, display panel, keypad, and programmed bar code symbol scanner for automatically surfing to Web-sites listed in a Web-site guide by simply scanning corresponding URL-encoded bar code symbols printed on the pages thereof;

FIG. **4** is a schematic representation of an exemplary window of an Internet browser program running on the system of FIG. **1**, and also an exemplary window for the URL-menu Composition/Printing Module plug-in of the present invention allowing its user to compose, transmit and print URL-encoded menus according to the principles of the present invention;

FIG. **5** is a schematic representation of an exemplary sequence of Web-sites along a Web-site "surf course" that are to be digested within a URL-encoded menu composed and printed according to the present invention;

FIG. **6**A is a schematic representation of an exemplary portion of an information storage structure for a URL-encoded Menu, showing the various information storage fields contained therein;

FIG. **6**B is a schematic representation of an exemplary section of the URL-encoded Menu of FIG. **6**A, showing the various information display fields contained therein;

FIGS. **7**A and **7**B provide a flow chart setting forth the steps carried out during the execution of the illustrative embodiment of the Bar Code Menu Composition/Printing Module of the present invention;

FIG. **8** is a schematic diagram of the Web-Based Package Routing, Tracking and Delivery (RTD) System of the Present Invention showing a plurality of RTD Internet Servers connected to the Internet infrastructure, a plurality of Package Routing Subsystems located at remote hub stations of the system and connected to the RTD Internet Servers by way of the Internet infrastructure, a plurality of Log-In Shipping Computer Subsystems located at product shipping locations throughout the world and connected to the RTD Internet Servers by way of the Internet infrastructure, and a plurality of Portable Package Delivery (PPD) Computer-Based Subsystems with wireless connection to the RTD Internet Servers;

FIG. **9** is a schematic representation of a Package Log-in/Shipping Computer-Based Subsystem of the Web-based RTD System of the present invention;

FIG. **10**A is a schematic diagram showing the various information fields of a first, preferred illustrative embodiment of a URL/ZIP-CODE encoded bar code symbol for use with the RTD system hereof;

FIG. **10**B is a schematic diagram showing the various information fields of a second illustrative embodiment of a URL/ZIP-CODE encoded bar code symbol for use with the RTD system hereof;

FIG. **11** is a schematic representation of a RTD Internet Server (Subsystem) of the Web-based RTD System of the present invention;

FIG. **11**A is a schematic representation of the information architecture of the RTD Internet Server of the Web-based RTD System of the present invention, showing its relational database management system (RDBMS), Common Gateway

Interface (CGI), and HTTP Server serving an HTML-encoded web-page having URL-specified information storage fields represented therein;

FIG. **11**B is a schematic representation of an information structure comprising information elements stored in the RDBMS of the RTD Internet Server that are linked to an information storage location in an HTML-encoded web-page which is specified by a Uniform Resource Locator (URL) that has been uniquely assigned to a particular package being tracked within the RTD system of the present invention;

FIG. **12** is a flow chart illustrating the steps carried out at the Package Log-In/Shipping Subsystems during a package logging-in operation within the RTD system of the present invention;

FIG. **13** is a schematic diagram of a Package Routing Subsystem located at a routing hub within the RTD system of the present invention, shown scanning a URL/ZIP-CODE encoded bar code symbol on a shipped package being routed therewithin;

FIG. **14** is a flow chart illustrating the steps carried out at each Package Routing Subsystem upon the reading of a URL/ZIP-CODE encoded bar code symbol on a package during a package routing operation within the RTD system of the spresent invention;

FIG. **15** is a schematic diagram of a Portable Package Delivery Subsystem of the present invention shown scanning the URL/ZIP-CODE encoded bar code symbol on a shipped package during a package delivery operation within the RTD system of the present invention; and

FIG. **16** is a flow chart illustrating the steps carried out during a package delivery operation using a Portable Package Delivery Subsystem of the present invention.

DETAILED DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENTS OF THE PRESENT INVENTION

The illustrative embodiments of the present invention will be described with reference to the figure drawings wherein like elements and structures are indicated by like reference numbers.

Overview Of The Internet Access System Hereof

In general, the system and method of the present invention is practiced in connection with a globally-based digital telecommunications network (known as the Internet). The function of the Internet is to provide an infrastructure that supports wired and wireless digital telecommunications throughout the world using the well known TCP/IP networking protocols. In general, the Internet infrastructure comprises Internet Service Providers (ISPs), Network Service Providers (NSPs), routers, telecommunication lines and channels, etc., all well known in the art.

As shown in FIG. **1**, many Internet Web-site Servers (i.e., server computer systems) **2** physically located throughout the world are connected to the Internet **1** by way of the Internet infrastructure (i.e., ISPs and NSPs). As the name implies, the function of an Internet Server **2** is to serve information resources to Internet users when requested to do so by a client computer system. The location of each and every information resource on an information server connected to the Internet infrastructure is specified by a Uniform Resource Locator (URL), the syntax of which is well known in the art. Any client computer system that provides access to such information resources by scanning one or more URL-encoded bar code symbols in accordance with the principles taught herein shall hereinafter be referred to as an "Internet Access System" or "Internet Access Terminal", generally indicated by reference number **3** in the drawings.

In general, each Internet Information server **2** and client system **3** may be connected to the Internet infrastructure **1** by way of an ISP **4** (or NSP) using physical communication media or a wireless (RF-based) digital communication link **5** well known in the art. Notably, while each illustrative embodiment of the Internet Access System hereof is realized in the form of a Client System operably connected to the infrastructure of the Internet by way of an ISP, it is understood that the Internet connection may be achieved through an NSP or other access point in the Internet infrastructure.

In the illustrative embodiments, each Internet Web-site Server **2** is realized as a computer system running conventional Web-site server software (e.g., WebStar® from StarNine, Inc., FASTRAK™ Server from Netscape Communications, Inc, or Microsoft® Internet Information Server from Microsoft Corporation) and is interfaced with an ISP in a conventional manner. Each Internet Web-site Server is assigned a unique TCP/IP address (and Domain Name) on the Internet, and is provided with Internet networking software to support the TCP/IP protocol. In addition, each Internet Web-site server is provided with one or more application software programs for creating and maintaining hypermedia documents containing text, graphics and audio information within an information file structure expressed in HTML. Each HTML document on the WWW is physically stored in an Internet Server **2**. The location of such information storage on the WWW is specified by its URL. The function of a URL is best illustrated by way of example. Metrologic Instruments, Inc., the Assignee of the present invention, has launched a WWW site having a "home page" (i.e., first page) specified by the following URL: "http://www.metrologic.com". The type of information maintained at this Web-site, beginning with Metrologic's home page, can be virtually any type of information (e.g of a multi-media nature) and typically will be periodically or continuously updated to reflect changes in the company, its products, its services and the like. The same is generally true for each and every other Web-site on the Internet, regardless of the type of information being served to requesting client systems.

In general, there are several different ways of accessing information resources on the Internet by scanning URL-encoded or DN-encoded bar code symbols in accordance with the present invention. Four generalized methods of accessing information resources on the Internet using URL-encoded bar code symbols are illustrated in FIGS. **1**B(1), **1**B(2), **1**B(3) and **1**B(4). Each of these generalized methods can be carried out within the particular illustrative embodiments of the Internet Access System shown in FIGS. **1**, **2** and **3** to be described in great detail hereinafter.

First Generalized Method Of Information Resource Access On The Internet Using URL-Encoded Code Symbols

In FIG. **1**B(1), a first generalized method of accessing information on the Internet using URL-encoded bar code

symbols is illustrated. As shown, this access method can be carried out using an Internet Access System **3** comprising two primary subsystem components, namely: (1) a programmed bar code symbol reader **3A**; and (2) an Internet Terminal **3**B. The primary function of the programmed bar code symbol reader **3A** is to read a bar code symbol **8** that has been encoded with (i) the Internet browser program command that writes the URL into the information resource ""Goto"" window (i.e. "Goto" buffer) of the Internet browser program, (ii) the complete URL of an Internet information resource to be accessed, and (iii) the Internet browser program command that executes a Hyper-Text Transmission Protocol (IITTP) request on the URL entered into the "Goto" window. The function of the Internet Terminal **3**B is to: (1) provide an interconnection to the Internet infrastructure by way of ISP **4** (or NSP) using communication media or link **5**; and (2) carry out the client-side of the Internet protocol (e.g., HTTP, FTP, etc.) required to access and display the particular information resource specified by the URL encoded within the bar code symbol.

In general, programmed bar code symbol reader **3A** comprises a number of subsystem components, namely: an optical scanning device and scan data processor means **3A1** (e.g., bar code laser scanner, CCD-based bar code scanner, etc.); programmable decoder module **3A2** (e.g., programmed microprocessor with control and decoding algorithms); and data transmission circuitry **3A3**. The function of the optical scanning device and scan data processor means **3A1** is to optically scan bar code symbols, and produce words of digital scan data (representative of the length of the bars and spaces of the code symbol) for use in subsequent decode processing. The function of the programmable decoder module **3A2** is to process these words of digital scan data and produce ASCII-based symbol character data representative of the decoded bar code symbol. The function of data transmission circuitry **3A3** is to transmit the ASCII formatted data from decoder module **3A2** to Internet Terminal **3**B for use in accessing and displaying the particular information resource specified by the URL encoded within the decoded bar code symbol.

In FIG. **1**B(1), the Internet Access System of the first generalized embodiment is shown reading the single 1-D URL-encoded bar code symbol. In this generalized embodiment, the URL-encoded bar code symbol contains ASCII code elements that are representative of the following information items: (1) the Internet browser program command (e.g., CTL(L)) that writes the URL into the information resource "Gotoul window of the Internet browser program; (2) the complete URL of the Internet information resource to be accessed (e.g., http://www.metrologic.com); and (3) the Internet browser program command (e.g., RTN) that executes an HTTP request on the URL entered into the "Gotoll window. It is understood, however, such information may be encoded into a 2-D bar code symbol as shown in FIG. **1**C(2), or alternatively in multiple 1-D URL-encoded bar code symbols, as shown in FIG. **1**D(1).

In FIG. **1**D(1), a pair of bar code symbols are used to encode the information contained in the bar URL-encoded bar code of FIG. **1**C(1). In such an embodiment, the first bar code symbol contains ASCII code elements representative of: (1) the Internet browser program command (e.g., CTL (L)) that writes the URL into the information resource "Goto" window of the Internet browser program; (2) the main URL of an Internet information resource to be accessed (e.g., http://www.metrologic.com); and (3) the Internet browser program command (e.g., RTN) that executes an HTTP request on the URL entered into the "Goto" window. The second bar code symbol contains ASCII code elements representative of: (1) the Internet browser program command (e.g., CTL(L)) that writes the URL into the information resource "Goto" window of the Internet browser program; (2) the Path Name portion of the URL of the Internet information resource to be accessed (e.g., /Products/ms6720.html); and (3) the Internet browser program command (e.g., RTN) that executes an HTTP request on the URL entered into the "Goto" window. In either of the above illustrative embodiments, it will be common for URL-encoded bar code symbols to include a Path Name portion thereof (e.g., /Mfg/bocaraton), as illustrated in FIG. **1**D(2), which may be of substantial character length in many instances.

These alternative coding techniques can be advantageous where the character length of the URL becomes significantly large, as in the case where the information resource to be accessed is located deep within a number of subdirectories or subfolders of an information server, or within a back-end database connected to the information server by way of a CGI or like mechanism.

At this juncture, a brief discussion about information formats and bar code symbologies is in order. In general, the information that must be encoded into the structure of a bar code symbol in accordance with the present invention is expressible in the ASCII data format. This fact is based on the nature of the characters used in URL specification, browser design and keyboard construction. Thus, any bar code symbology capable of representing the characters in the ASCII character set can be used to practice the information encoding technique of the present invention. In the preferred embodiment, any one of the following bar code symbologies can be used for URL-encoding: Code 128; full ASCII character set of Code 39; and Code 93. While an ASCII formatted character string has been encoded within the bar code symbol of FIG. 1E(1), the information string actually transmitted from bar code symbol reader **3A** to the Internet browser program (of the Internet Terminal **3**B) will be typically expressed in the hexidecimal number format shown in FIG. **1**E(2). It is understood, however, that the format of the transmitted information string may differ from embodiment to embodiment of the present invention.

Second Generalized Method Of Information Resource Access On The Internet Using URL-Encoded Code Symbols

In FIG. 1B(2), a second generalized method of accessing information on the Internet using URL-encoded bar code symbols is illustrated. As shown, this access method can be carried out using an Internet Access System **3** comprising two primary subsystem components, namely: (1) a programmed bar code symbol reader **3A'**; and (2) Internet Terminal **3**B. The function of the programmed bar code symbol reader **3A'** is to: (i) read a bar code symbol that has been encoded with the complete URL of an Internet information resource to be accessed; and (ii) affix thereto a prefix code string (i.e. CTR(L)) representative of the Internet browser program command that writes the URL into the information resource "Goto" window of the Internet browser program, and a suffix code string (i.e. RTN) representative of the Internet browser program command that executes an HTTP request on the URL entered into the "Goto" window. The function of the Internet Terminal **3**B is to: (1) provide an interconnection to the Internet infrastructure by way of ISP **4** (or NSP) using communication media or link **5**; and (2) carry out the client-side of the Internet protocol (e.g., HTTP, FTP, etc.) required to access and display the particular information resource specified by the URL encoded within the bar code symbol.

In general, programmed bar code symbol reader **3A'** comprises a number of subsystem components, namely: optical scanning device and scan data processor **3A1** (e.g., bar code laser scanner, CCD-based bar code scanner, etc.); programmable decoder module **3A2** (e.g., programmed microprocessor with control and decoding algorithms); data transmission circuitry **3A3**; an ASCII code generation module **3A4**; and a code string synthesizer module **3A5**. The function of the optical scanning device and scan data processor **3A1** is to scan bar code symbols, and produce words of digital scan data (representative of the length of the bars and spaces of the code symbol) for subsequent decode processing. The function of the programmable decoder module **3A2** is to process such words of digital scan data and produce ASCII-based symbol character data representative of the decoded bar code symbol. The function of the ASCII code generation module **3A4** is to generate (1) an ASCII-based prefix code string (i.e. CTR(L)) representative of the Internet browser program command that writes the URL into the information resource "Goto" window of the Internet browser program, and (2) a suffix code string (i.e. RTN) representative of the Internet browser program command that executes an HTTP request on the URL entered into the "Goto" window. The function of the code string synthesizer module **3A5** is to synthesize the prefix and suffix code strings produced from ASCII code generator **3A4**, with the URL character string from programmable decoder module **3A2**, in order to form a complete code string for transmission to the Internet browser program by way of data transmission circuitry **3A3**. The function of data transmission circuitry **3A3** is to transmit ASCII formatted data from the code string synthesizer module **3A5** to Internet Terminal **3B** for use in accessing and displaying the particular information resource specified by the URL encoded within the decoded bar code symbol.

In FIG. **1B(2)**, the Internet Access System of the second generalized embodiment is shown reading a single 1-D URL-encoded bar code symbol **8**. In this generalized embodiment, the URL-encoded bar code symbol contains ASCII code elements representative of the complete URL of an information resource to be accessed from the Internet (e.g., http://www.metrologic.com). It is understood, however, that the information encoded within the 1-D bar code symbol structure of FIG. **1B(2)** can be encoded into a 2-D. bar code symbol structure or a pair of 1-D bar code symbols as described hereinabove.

Third Generalized Method Of Information Resource Access On The Internet Using URL-Encoded Code Symbols

In FIG. **1B(3)**, a third generalized method of accessing information on the Internet using URL-encoded bar code symbols is illustrated. As shown, this access method can be carried out using an Internet Access System **3** comprising two primary subsystem components, namely: (1) a programmed bar code symbol reader **3A"**; and (2) an Internet Terminal **3B**. The function of the programmed bar code symbol reader **3A"** is to: (i) read a bar code symbol that has been encoded with the complete URL of an Internet information resource to be accessed; (ii) affix thereto prefix code strings representative of (1) the Internet browser program command that writes the URL into the information resource "Goto" window of the Internet browser program and (2) the Internet protocol identifier (e.g., "http://"); and (iii) affix thereto a suffix code string representative of the Internet browser program command that executes an HTTP request on the URL entered into the "Goto" Window. The function of the Internet Terminal **3B** is to: (1) provide an interconnection to the Internet infrastructure by way of ISP **4** (or NSP) using communication media or link **5**; and (2) carry out the client-side of the Internet protocol (e.g., HTTP, FTP, etc.) required to access and display the particular information resource specified by the URL encoded within the bar code symbol.

In general, the programmed bar code symbol reader of this illustrative embodiment **3A"** comprises a number of subsystem components, namely: optical scanning device and scan data processor **3A1** (e.g., bar code laser scanner, CCD-based bar code scanner, etc.); programmable decoder module **3A2** (e.g., programmed microprocessor with control and decoding algorithms); data transmission circuitry **3A3**; an ASCII code generation module **3A4'**; and a code string synthesizer module **3A5**. The function of the optical scanning device and scan data processor **3A1** is to scan bar code symbols, and produce words of digital scan data (representative of the length of the bars and spaces of the code symbol) for subsequent decode processing. The function of the programmable decoder module **3A2** is to process these words of digital scan data and produce ASCII-based symbol character data representative of the decoded bar code symbol. The function of the ASCII code generation module **3A4'**, is to generate: (1) an ASCII-based prefix code string (i.e. CTR(L)) representative of the Internet browser program command that writes the URL into the information resource "Goto" window of the Internet browser program; (2) the appropriate Internet protocol identifier (e.g., "http://"); and (3) a suffix code string (i.e. RTN) representative of the Internet browser program command that executes an HTTP request on the URL entered into the "Goto" window. The function of code string synthesizer module **3A5** is to synthesize the URL character code produced by decoder module **3A2'**, with the code strings produced by ASCII code generator **3A4'**, in order to form a complete code string for transmission to the Internet browser program by way of data transmission circuitry **3A3**. The function of data transmission circuitry **3A3** is to transmit ASCII formatted data from the code string synthesizer module **3A5** to Internet Terminal **3B** for use in accessing and displaying the particular information resource specified by the URL encoded within the decoded bar code symbol.

In FIG. **1B(3)**, the Internet Access System of the third generalized embodiment is shown reading a single 1-D URL-encoded bar code symbol **8**. In this generalized embodiment, the URL-encoded bar code symbol contains ASCII code elements representative of the complete URL of an Internet information resource to be accessed. It is understood, however, that the information encoded within the 1-D bar code symbol structure of FIG. **1B(3)** can be encoded into a 2-D bar code symbol or a pair of bar code symbols as indicated hereinabove.

Fourth Generalized Method Of Information Resource Access On The Internet Using URL-Encoded Code Symbols

In FIG. **1B(4)**, a fourth generalized method of accessing information on the Internet using URL-encoded bar code symbols is illustrated. As shown, this access method can be carried out using an Internet Access System **3** comprising two primary subsystem components, namely: (1) a programmed bar code symbol reader **3A**; and (2) an Internet Terminal **3B'**. The function of programmed bar code symbol reader **3A** is to read a bar code symbol that has been encoded with the complete URL of an Internet information resource to be accessed. The function of Internet Terminal **3B'** is to: (1) provide an interconnection to the Internet infrastructure by way of ISP **4** (or NSP) using communication media or link **5**; and (2) carry out the client-side of the Internet protocol (e.g., HTTP, FTP, etc.) using an Internet browser

program (e.g., with a plug-in module) which, upon scanning a bar code symbol, automatically writes the URL thereof into the information resource "Goto" window of the Internet browser program and executes a HTTP request on the URL entered into the "Goto" Window.

In general, programmed bar code symbol reader of this illustrative embodiment **3**A comprises a number of subsystem components, namely: optical scanning device and scan data processor **3A1** (e.g., bar code laser scanner, CCD-based bar code scanner, etc.); programmable decoder module **3A2** (e.g., programmed microprocessor with control and decoding algorithms); and data transmission module **3A3**. The function of the optical scanning device and scan data processor **3A1** is to optically scan bar code symbols, and produce words of digital scan data (representative of the length of the bars and spaces of the code symbol) for subsequent decode processing. The function of the programmable decoder module **3A2** is to process these words of digital scan data and produce ASCII-based symbol character data representative of the decoded bar code symbol. The function of data transmission circuitry **3A3** is to transmit ASCII formatted data from programmable decoder module **3A2** to Internet Terminal **3**B for use in accessing and displaying the particular information resource specified by the URL encoded within the decoded bar code symbol.

In FIG. 1B(4), the Internet Access System of the fourth generalized embodiment is shown reading a single 1-D URL-encoded bar code symbol. In this generalized embodiment, the URL-encoded bar code symbol contains ASCII code elements representative of the complete URL of an Internet information resource to be accessed (e.g., http://www.metrologic.com). It is understood, however, that the information encoded within the bar code symbol structure of FIG. **1**B(4) can be encoded into a 2-D bar code symbol or a pair of 1-D bar code symbols as indicated hereinabove.

The generalized embodiments of the Internet Access System of the present invention shown in FIGS. 1B(1) through **1**B(4) and described above can be realized in a variety of ways using different types of enabling technology and system configurations tailored to the particular application at hand. Three different particular embodiments of the Internet Acces System will now be described below in detail with reference to FIGS. **1**, **2** and **3**.

First Preferred Embodiment Of The Internet Access System Hereof

As illustrated in FIG. **1**, the first preferred (particular) embodiment of the Internet Access System hereof **3** is realized in the form of a desktop computer system **6** connected to the Internet by way of an ISP **4**. As shown, the desktop computer system consists of a video monitor **6**A, processor **6**B, keyboard **6**C, mouse **6**D, and Postcript® laser printer **35**. The computer system **6** has a GUI-based web browser program and a hand-held, wireless laser scanning bar code symbol reading system which is connected to the communication port of this host system in a conventional manner. In the preferred embodiment, wireless bar code symbol reading system comprises a hand-supportable laser scanning bar code symbol reading device **7**A and a base unit **7**B which receives RF signals transmitted from device **7**A upon the successful reading of each bar code symbol thereby. The base unit then **7**B produces an acoustical acknowledgement signal in response to each such successful read. The bar caode symbol reading system can be realized by any one of the (i) wireless bar code symbol reading systems disclosed in application Ser. No. 08/292,237 filed Aug. 17, 1994, or (ii) tethered bar code symbol reading systems disclosed in application Ser. Nos. 08/476,069 and 08/660,643, each said application being incorporated herein by reference.

While the operation of programmed bar code symbol reader will differ slightly depending on which generalized Internet Access Method is used, the functions which it carries out will be generally the same, namely: to read a bar code symbol **8** that is encoded with either the URL or DN/PN of an information resource (e.g., Web-site) to be accessed by the Internet Access System; and produce symbol character data representative of the URL or DN/PN character string for use by the Internet browser program of its associated Internet Terminal. As used hereinafter, these special types of encoded bar code symbols shall be generally referred to as "URL-encoded bar code symbols", regardless of whether the complete URL or only a portion thereof (e.g., DN or DN/PN) is encoded within the bar code symbol structure.

In the case of where either the first, second or third generalized Internet access method detailed in FIGS. **1**B(1), **1**B(2) and **1**B(3), respectively is employed, the Internet Terminal (realized by desktop computer system **6**) can provide Internet access support by running any conventional GUI-based Internet browser program, such as the Navigator® from Netscape or the Internet Explorer® from Microsoft.

In the case of where the fourth generalized Internet access method of FIG. 1B(4) is used, conventional browser programs of the type mentioned above must be provided with a Plug-in Module (e.g., browser subprogram) that can be readily written and installed within the browser program. The function of such a Plug-In Module is to: (i) automatically read scanned-URL information that is stored within an addressed data buffer at the I/O port of the client computer platform **6** (supporting the Internet Terminal); (ii) automatically write the URL information (in an appropriate format) to the data buffer assigned to the "Goto" window **40**A of the Internet browser display screen **40** (shown in FIG. **4**); and then (iii) automatically initiate HTTP over the Internet to connect to the associated Internet Server and access and display the information resource located at the cenetered URL. In such embodiments, it is preferred that each Internet Access System has a preloaded Internet browser program provided with the above-described Plug-In Module, or the functionalities provided thereby. It is understood, however, that in some instances it may be desirable to distribute or down-load the browser program and plug-in module to client computer systems from an Internet-based Information Server on the WWW using the well known file transfer protocol (FTP). In this way, conventional client computer systems can be easily converted into Internet Access Systems according to the present invention.

In the preferred embodiments of the invention, the bar code symbol reading system is a laser scanning bar code symbol reader (e.g., a Metrologic Scanner MS951-48 with keyboard wedge) which is connected to the data-input port of the client computer platform **6**. When used to read a URL-encoded bar code symbol, the URL is automatically entered as input into the "Goto" window of the Internet browser program, and, by way of HTTP, the particular information resource corresponding to the URL is automatically accessed by the Internet Access System for display on visual display terminal **6**A in a manner well known in the art.

As mentioned hereinabove, each URL-encoded bar code symbol of the present invention can be either a linear (1-D) or 2-D bar code symbol structure of virtually any symbology that allows for the encoding of the (ASCII-type) information contained within a URL-type information structure, the syntax of which is well known in the art. In the preferred embodiment, the URL-encoded bar code symbol **8** is real-

ized as a truncated-type bar code symbol constructed using any one of the following bar code symbologies: Code 128; full ASCII character set of Code 39; and Code 93. Preferably, each such bar code symbol is printed above, below or alongside each Web-site URL **14** or its listing in a Web-site guide or directory **13**. Method and apparatus for composing and printing such bar code symbol lists and menus will be described in greater detail hereinafter. While the URL-encoded bar code symbol can be of any length, practical considerations will typically dictate which encoding technique should be used in any particular application. Notably, the advantage of using the truncated bar code symbol structure is that the height of the bars and spaces is relatively short in relation to the length of the bar code, thus allowing the URL-encoded truncated symbol **8** to be easily printed adjacent to each Web-site listing appearing on crowded pages of Web-site guides and catalogues, as illustrated in FIG. **1A**.

In accordance with the present invention, Web-site listings and menus, in which URL-encoded bar code symbols may be printed, include various types of printed guides, directories or publications which digest, catalogue, organize or otherwise list WWW sites or information resources that exist on Web-site Servers throughout the Internet. Examples of such printed Web-site publications include, for example: the "WWW Yellow Pages" (1996) published by New Riders Publishers, Inc.; "PC NOVICE GUIDE TO THE WEB: How to find Anything on the Web" (1996) published by Peed Corporation; "Cybersurfer", published by Starlog Group, Inc.; "Internet Underground", published by Ziff-Davis; "Internet User", published by Ziff-Davis; "Internet World", published by Mecklermedia; "The Net", published by Imagine Publishing; "Net Guide", published by CMP Media; "Online Access", published by Red Flash Internet; "The Web", published by International Data Group; "Websight", published by New Media, Inc.; "Yahoo Internet Life", published by Ziff-Davis and Yahoo; WebTV Guides; or any other printed publication that one may use to find an information resource (e.g., Web-site) of interest for access and exploration.

As shown in FIGS. **1** and **1A**, the programmed bar code symbol scanner of the Internet Access System of the first preferred embodiment is particularly designed so that closely nested Web-site listings on a single page can be read without inadvertently reading undesired URL-encoded bar code symbols. This added scanning control feature is achieved in the bar code symbol reader of FIG. **1** by providing the automatic laser scanning bar code symbol reader **7A** with an optically-transparent scanning plate **9A** supported from reader **7A** by an optically transparent extension **9B**. The scanning plate **9A** has formed therein a sighting window (i.e., aperture) **10**, through which a URL-encoded bar code symbol **8** is automatically scanned and read when such a printed symbol (on a substrate) is aligned with the sighting aperture. In this particular embodiment, the IR-based object detection field **11** of bar code symbol reader **7A** extends just slightly beyond the sighting window **10** so that laser scanning by laser beam **12** is automatically initiated only when an object (e.g., Web-site guide) **13** is placed up against the sighting window **10**, as when the scanning plate is brought in contact with URL-encoded bar code symbol **8** associated with a particular Web-site listing, shown in FIG. **1A**. The design and construction details associated with automatic bar code symbol reader **7A** can be found in Applicant's prior U.S. application Ser. No. 08/292,237 filed Aug. 17, 1994, incorporated herein by reference. As shown in FIG. **1**, this scanning device can be provided with a keypad **15** in a manner known in the art, for manually entering the characters of URLs, as needed or required.

As discussed above in connection with FIG. **1D**(1), it may be desirable to encode the URL of a particular information resource within two or more moderate-length bar code symbols, instead of within a single long-length bar code symbol. This will allow the use of shorter length bar code symbols on printed menus and lists. In such applications, the primary (i.e., base) portion of the URL (e.g., "http://www.metrologic.com") identifying the location of the WWW Server can be encoded within a first bar code symbol, whereas the auxiliary (i.e., extension) portion of the URL (e.g., "/products/MS6720.html") indicating the location of the information resource (web pages) relative to the identified WWW Server can be encoded with a second bar code symbol. With this technique, access to such an Internet-based information resource can be achieved in a two-step process, namely: (1) scan the first bar code symbol to access the home page of the WWW Server located by llhttp://www.metrologic.com"; and (2) scan the second bar code symbol to access the information resource located by "Products/MS6720/.html". Preferably, the base (i.e. primary) and auxiliary segments of the URL would be printed below the first and second bar code symbols respectively, as shown in FIG. **1D**(1). This composite bar code symbol structure can be used during the menu composition process of the present invention as described in detail hereinabove.

Second Preferred Embodiment Of The Internet Access System Hereof

As illustrated in FIG. **2**, the second preferred embodiment of the Internet Access System hereof is realized in the form of an interactive web-based television system **16**. Any of the generalized Internet access methods described hereinabove can be used to carry out this particular embodiment of the present invention.

As shown, interactive web-based television system **16** comprises an Internet Terminal Unit **17**, a Remote Control Scanning Device **18** and a standard (NTSC or PAL) color television set **19**. As shown, the Internet Terminal Unit **17** is connected to the Internet by way of an ISP **4** and includes means for supporting: (i) a GUI-based Internet browser program such as the Internet Navigator® from Netscape Communications or the Internet Explorer® from Microsoft, Inc.; and (ii) the TCP/IP networking protocol on the Internet. In the preferred embodiment, the Internet Terminal Unit **17** can be realized using any one of a number of commercially available Internet Terminal devices, such as, for example: the Mediamaster 9500™ Internet Terminal from Nokia, Inc.; the NetStation™ Internet Terminal from Acorn Computer; or the "Internet Digital Appliance" from Diba.

As shown in FIG. **2**, the Remote Control Scanning Device **18** of the second preferred embodiment can be realized by integrating a miniature automatic bar code symbol reading module **20** into the wireless remote control device that is provided with the commercially available terminal unit that is used to practice this embodiment of the present invention. Preferably, automatic bar code symbol reading module **20** is similar to the device described in great detail in Applicant's application Ser. No. 08/292,237 supra. Such laser scanning engines, as they are called, are commercially available from Metrologic Instruments, Inc., of Blackwood, N.J., under the tradename ScanQuest®. The manner in which such a laser scanning engine can be integrated into any one of the remote control devices of the above-identified Internet Terminals, and thus provide the Remote Control Scanning Device **18**, will be described below.

The Mediamaster 9500™ Internet Terminal from Nokia, Inc., the NetStation™ Internet Terminal from Acorn Computer, or the Internet Digital Appliance from Diba, are each provide with a wireless remote control device which includes a programmable microcontroller (i.e., microprocessor) operably connected to a system bus of one sort or another. The system subcomponents that are connected to this system bus structure include, for example: program memory realized in the form of EPROM **21**; data storage memory realized in the form of RAM **22**; a keypad **23**, data storage registers and interface circuitry; an IR-based communication circuit and interface circuitry **24**; and a power supply and power distribution circuitry **25**. In such commercial products, no visual display device (e.g., LCD panel) is provided, as all display functions are provided on the television screen using an on-screen display format well known in the art. Integration of an automatic ScanQuest® Laser Scanning Module (Model No. IS4120) into the system architecture of such wireless remote control devices can be achieved by adding additional data registers to the system bus, and connecting the data output port of the scanner to such registers in a conventional manner. Additional control logic will have to be provided by the microcontroller in to provide scan data from the scanner to have priority over data entered manually into the system. All such modifications are within the ordinary skill in the art.

As shown in FIG. **2**, Remote Control Scanning Device **18** has an optically-transparent scanning plate **9A** supported by an optically transparent extension **9B**. The scanning plate **9A** has formed therein a sighting window (i.e., aperture) **10**, through which a URL-encoded bar code symbol **8** is automatically scanned and read when such a printed symbol (on a substrate) is aligned with the sighting aperture. The IR-based object detection field **11** extends just slightly beyond the sighting window **10** so that the laser scanning beam **12** is automatically initiated only when an object (e.g., Web guide) **13** is placed up against the sighting window **10**, as when the scanning plate **10** is brought in contact with URL-encoded bar code symbol **8** associated with a particular Web-site listing, shown in FIG. **2**. During operation, the Remote Control Scanning Device **18** is used to read URL-encoded bar code symbols **8** printed on Web-site GuideBook **13** in order to connect to the corresponding Web-sites thereof.

While any standard (NTSC or PAL) color television set can be used in connection with the Internet Terminal **17** to display graphical and audio information content associated with any particular Web-site accessed by the system, it is preferred that a higher-resolution (VGA or SVGA) computer monitor is used in connection therewith to display high resolution graphics.

Third Preferred Embodiment Of The Internet Access System Hereof

As shown in FIG. **3**, the third preferred embodiment of the Internet Access System hereof is realized in the form of a hand-held Integrated Scanning Terminal **26**. Any of the generalized Internet access methods described herein can be used to carry out this particular embodiment of the present invention. The Internet Scanner Terminal **26** is shown connected to an ISP **4** by way of a radio-base station **27** and wireless link **5**. The hand-held Internet Scanning Terminal **26** has an integrated GUI-based web browser program, display panel **28**, touch-screen type keypad **29**, and programmed bar code symbol scanner **20**. The function of bar code symbol scanner **20** is to read a bar code symbol **8** that is encoded with the URL of a Web-site to be accessed by the Internet Access System, and produce symbol character data representative thereof.

In the illustrative embodiment, the Internet Scanner Terminal **26** is realized as a transportable computer, such as the Newtons Model 130 Messagepad **30** from Apple Computer, Inc. of Cupertino, Calif. This device is provided with NetHopper™ brand Internet Access Software from which supports the TCP/IP networking protocol within the Newton MessagePad. The Newton Messagepad is also equipped with a Motorola PCMICA-based modem card **31** having a RF transceiver for establishing a wireless digital communication link with either (i) a cellular base station, or (ii) one or more satellite-base stations **(27)** connected to the Internet by way of an ISP **4** in a manner well known in the global information networking art. While it is understood that, in some instances, it may be desired to connect a pen or wand device to the serial port of the Newton MessagePad to provide bar code symbol reading capabilities thereto, it is generally preferred that automatic laser scanning engine **20** (e.g., Metrologic ScanQuest® Laser Scanning Module Model No. IS4120), be interfaced with the serial communications port of the Newton MessagePad so as to realize the Internet Access System of the third preferred embodiment hereof.

As shown in FIG. **3**, the entire Newton MessagePad, ScanQuest® Laser Scanning Module **20** and auxiliary battery supply (not shown) are completely housed within a rubberized shock-proof housing **32**, in order to provide a hand-supportable unitary device. The rubberized housing is provided with an scanning aperture **10** realized within an optically transparent scanning plate **9B** supported by extension **9A**. The function of the scanning aperture **10** is to allow the projected laser beam **12** to sweep across a URL-encoded bar code symbol **8** located within the sighting window **10** of optically-transparent scanning plate **9B**, once the object (e.g., Web-site guide) **13** is detected by the object detection field **11**.

In each of the three particular embodiments of the Internet Access System described above, the bar code symbol scanner can be replaced by a programmed optical character reader realized using, for example, the automatic holographic laser scanning technology disclosed in great detail in Applicant's copending application Ser. No. 08/573,949 filed Dec. 18, 1995, incorporated herein by reference. The function of the programmed optical character reader is to allow the Internet Access Terminal to access any desired Internet-based information resource by optically scanning the alphanumeric character string comprising the URL thereof, and provide the same as output to the "Goto" Window of the GUI-based Internet browser program thereof. In such alternative embodiments, the function of the optical character reader (i.e., character reading module) is to read the ASCII characters comprising the URL (and other encoded information) **14** printed on an object or article such as a Web-site guide or like publication, avoiding the need for manual key entry operations.

Subsystem For Composing and Printinq URL-Encoded Bar Code Lists and Menus

Having described various illustrative embodiments of the Internet Access System of the present invention, it is appropriate at this juncture to describe a system and method for composing, transmitting and printing lists (e.g., menus) of URL-encoded bar code symbols in various ways according to the principles of the present invention.

As shown in FIG. **4**, the Web-linked client computer workstation **6** of FIG. **1** has a graphical user interface (GUI) and an Internet browser (or communicator) program that has an additional plug-in type module (i.e., subprogram) composing, transmitting and printing lists and menus of

URL-encoded bar code symbols and information elements associated therewith (hereinafter the "Composition/Printing Module"). Composition/Printing Module can be realized as a plug-in module to the Netscape Navigator browser program, the Microsoft Explorer browser program, or other Internet communication program presently available or developed in the years ahead, using programming techniques and languages (e.g., Java) known in the art. The purpose of this Module is to cooperate with the Internet browser program and support to the user during the composition and editing of lists (i.e., menus) of URL-encoded bar code symbols and information fields related thereto in accordance with the principles of the present invention, and then enable such lists and menus to be printed locally using printer **35** shown in FIG. **1**, or ADS transmitted to a remotely located system for printing. As such, the Module is provided with an editing mode to edit information entered into information fields associated with any particular bar code list or menu of the present invention. Composition and printing functionalities and enabling programming code embodied within the Module or browser program of the present invention can be found in Bar Code Pro® brand Bar Code Symbol Composing and Printing software sold by SYNEX, of Brooklyn, N.Y.; and Zooworks Research Personal (1.0) web-indexing software from Hitachi Computer Products (America) Inc, of Santa Clara, Calif. (URL:http://hitachisoft.com/research). optionally, the Module and/or browser program can also embody the functionalities provided by FilePro® bar code database software, also available from SYNEX.

As shown in FIG. **4**, the Composition/Printing Module has an associated "display window" **36** which can be opened in a conventional manner to allow the user to easily compile bar code symbol menus during operation of an Internet browser program. In the illustrative embodiment shown in FIG. **4**, the bar code menu display window **36** is shown to comprise information display fields **36A**, **36D**, **36N** associated with three exemplary information resources on the WWW that have been listed within a bar code menu in composition. As shown, this listing of information display fields graphically present on display monitor **6A**: a set of human-readable URLS corresponding to a set or course of information serving Web-sites schematically represented in FIG. **5**, **36A1**, **36B1**, **36N1**; a set of titles assigned to the URLs (which may be directed to the owner of the site, the information content contained therein, etc.) **36A2**, **36B2**, **36N2**; a set of brief descriptions of content (DOC) served at the Web-sites indicated by reference numerals **36A3**, **36B3**, **36N3**; and date or dates the set of Web-sites were last visited by the composer, indicated by reference numerals **36A4**, **36B4**, **36N4**.

In FIG. **6A**, an information storage structure **37** is shown for storing the information elements associated with a given URL information block in a bar code menu composed using the Composing/Printing Module during on-line Internet surfing sessions or while off-line. As shown, each information storage structure **37** comprises the following information fields for a given information resource: URL Field **37A** for storing information descriptive of the URL of Web-site location (e.g., information resource) associated therewith; URL-Encoded Bar Code field **37B** for storing information descriptive of the URL-Encoded bar code associated with the URL of the information resource; Title Field **37C** for storing information descriptive of the title assigned to the corresponding information resource; Content Description Field **37D** for storing information descriptive of the content of the information resource; and Data Field **37E** for storing information descriptive of the date the composer or his agent last visited the information resource prior to composition of the bar code symbol menu.

In FIG. **6B**, an exemplary section of a printed URL-encoded menu is shown. As shown, each printed block of information **38** associated with a particular Web-site (or Internet information resource) has the following information display fields: an information display field for graphically displaying the corresponding URL, indicated by reference numeral **38A**; an information display field for the URL-encoded bar code symbol, indicated by reference numeral **38B**; an information display field for graphically displaying the Title assigned to Web-site location referenced by the corresponding URL, indicated by reference numeral **38C**; and an information display field for graphically displaying the description of the information content served at the Web-site location referenced by the corresponding URL, indicated by reference numeral **38D**; and an information display field for graphically displaying the date on which the composer or his agent list visited the information resource, indicated by reference numeral **38E**. In general, a number of such information display blocks can be printed on a single sheet of print media (e.g., paper, plastic, etc.) **39**. The particular display layout for information display block will depend on the application at hand and typically will vary from embodiment to embodiment of the present invention. For example, in some embodiments, the printed information display blocks will be arranged in a single column down each printed sheet. In other embodiments, the printed information display blocks will be arranged in a two or more rows or columns. In yet other embodiments, the layout of such information display blocks may be of random or quasi-random structure.

FIGS. **7A** and **7B** set forth a high-level flow chart describing the steps carried out during composition, transmission and printing of URL-encoded bar codes according to the method of the present invention. In the illustrative embodiment, this method is carried out while using a GUI-based Internet browser program is on-line, with the above-described Composition/Printing Plug-In Module installed so that the user is enabled to compose, transmit and print bar code menus of the type schematically illustrated in FIGS. **6A** and **6B**. It is understood, however that the method can also be carried out while the Internet browser program is "off-line". Alternatively, the functionalities of the Composition/Printing Module (to be described in greater detail below) can be realized in a separate program designed to run "in the background" of the operating system (OS) while the Internet browser program is running, or run by itself when the Internet browser program is not running.

As indicated in Block A of FIG. **7A**, the method involves first determining completely or partially, a set or information resources on the Internet (e.g., WWW or FTP Servers) that the composer wishes he or another to visit in the immediate or future. Typically, although not always, the Internet browser program with the installed Composition/Printing Module hereof will be up and running during the composition process, generally represented at Blocks A through D in FIG. **7A**. This list or ordered set of information sources identified by the composer may be thematically related by a particular subject or topic which the composer may have in mind before, during or after the composition process. The list may be, however, simply a collection of information resources on the WWW, for example, which the composer would like to catalog in the form of a bar code menu so that others may easily visit the cataloged collection of Web-sites by simply reading URL-encoded bar code symbols from a

printed menu, as described hereinabove. In the field of education, for example, such bar code menus could be composed by teachers or professors and distributed to their students so that they can visit the catalogued Web-sites either inside or outside the classroom or lecture hall. Writers and/or editors of books, journals and magazines could print URL-encoded bar code symbols in the back of their publications (corresponding to references cited in their published publications). Brochures and manuals for products and/or services could contain lists of URL-encoded bar code symbols that point to information resources on the Internet, which contain information relating to such products and/or services. Printed (i.e., hard-copy) Web-site magazines, catalogues, directories and the like can be formatted with URL-encoded bar code symbols of the present invention, as illustrated in FIG. **1**A and described above, to enable Internet access thereto by scanning such encoded bar code symbols.

As indicated at Block B in FIG. **7**A, the composer employs the Internet browser program of the present invention to record the URLs for the set of information resources on the WWW. The URLs can be entered into their appropriate information recording fields, consecutively at a particular point in time, or over a period of time when the composer is surfing the WWW and determining which WWW information resources should be catalogued within the menu under composition.

As indicated at Block C in FIG. **7**A, the composer records a number of information items in an information storage file as shown in FIG. **6**A and displayed with the Internet browser screen **40** on the computer terminal shown in FIG. **4**. For each WWW information resource, the composer is encouraged to enter the following information items: the URL for the WWW information resource; the Title assigned to the WWW information resource by the composer; and the description of the information content at the WWW information resource. Collectively, these related items of information are stored within the information storage structure of the file maintained by the CTP Module and form an information block.

As indicated at Block D in FIG. **7**A, after each information block is recorded for a particular WWW information resource, the Composition/Printing Module is used to automatically generate a URL-encoded bar code symbol information structure therefor and record this information in its respective information field within the information storage structure represented in FIG. **6**. Once a list of URLs has been captured, indexed and recorded within the information storage structure underlying any particular bar code menu, the composer may then decide during the editing mode of the plug-in Module, exactly how the Web-site information blocks, shown in FIG. **6**B, should be ordered for presentation to his or her audience upon printing.

As indicated in FIG. E of FIG. **7**B, a composed bar code symbol menu as shown in FIG. **6**B is printed out on a sheet of paper using conventional Postscript® printing equipment **35**, illustrated in FIG. **1**, for example. At this stage of the process, the following information items are printed out for each WWW information resource: the URL for the WWW information resource; the URL-encoded bar code symbol; the title assigned to the WWW information resource by the composer; the description of the WWW information resource; and the date on which the composer or his agent last visited the information resource. Expectedly, the display format for any printed information file according to the present invention will vary from embodiment to embodiment. Preferably, the Composition/Printing module installed within the Internet browser program hereof will be provided with a number of different display formats, from which the composer can easily choose to satisfy the requirements of the project and application at hand.

As indicated at Block F, the composer may optionally choose to transport by electronic data transmission or facsimile transmission, any composed bar code symbol menu according to the present invention. In such instances, the compiled information storage file (as shown in FIG. **6**A) representing the composed menu can be electronically transmitted to a remote site, by e-mail, facsimile transmission, or other protocol available over the Internet, and thereafter printed out using appropriate print-driver software. This way, the WWW information resources listed in the compiled information structure can be easily visited by reading the corresponding URL-encoded bar code symbols into the Internet browser program using a bar code scanner. Alternatively, the bar code menu can be printed out locally and then transmitted to a remote location by way of facsimile transmission for print out and subsequent use. When using this latter technique, however, careful consideration must be accorded to the resolution of the printed bar codes, as their resolution may be significantly reduced due to scanning facsimile transmission, and printing required by this latter technique. In such instances, it may be desirable to scale-up the bar codes during menu composition to compensate for expected resolution losses downstream.

The bar code menu composition/printing process of the present invention has been described above in connection with a commercially available GUI-based Internet Browser program that has been provided with a plug-in module that enables the menu composition, transmission and printing processes of the present invention. It is understood, however, that in alternative embodiments of the present invention, an independent program may be written to carry out the interactive menu composition/transmission/printing process illustrated in FIGS. **7**A and **7**B. In such instances, the composition program could be designed to run in the background of the operating system while the composer is using the Internet browser program to explore Cyberspace and determine which Web-sites should be listed in the bar code menu in composition. Once a list of URLs has been captured and recorded within the information storage structure underlying any particular bar code menu, the composer may latter, during the editing mode of the program, decide exactly how the Web-site information blocks, shown in FIG. **6**A, should be ordered for presentation to his or her audience upon printing.

Having described the illustrative embodiments of the present invention, several modifications readily come to mind.

Instead of using a laser scanning module to construct the Internet Access Terminals of the present invention, as shown in FIGS. **1**, **2** and **3**, one may use CCD-type bar code scanning engines (or modules) employing LEDs to illuminate bar code symbols in the scan field, and CCD-type linear or array devices for capturing images thereof for subsequent decode processing. Examples of CCD scanning modules that can be used to construct CCD-based Internet Access Terminals according to the present invention can be found in the following U.S. Pat. Nos.: 5,550,366; 5,354,977; 5,291,009; 5,484,994; 5,349,172; and 5,532,467; each being incorporated herein by reference in its entirety.

As mentioned above, the present invention contemplates using encoding URL (or DN/PN) information within 2-D bar code symbols as schematically illustrated in FIG. 1C(1). In such instances, one would provide a 2-D bar code symbol

reading engine (or device) within each Internet Access System of the present invention so that to the URL information encoded within 2-D bar code symbols can be optically scanned and decoded using the appropriate 2-D bar code decoding algorithm. Examples of 2-D (laser scanning) bar code symbol reading devices that can be used to construct "2-D type" Internet Access Systems according to the principles of the present invention are disclosed in the following U.S. Pat. Nos.: 5,594,232; 5,523,552; 5,504,316; 5,414,250; 5,373,148; 5,319,181; each being incorporated herein by reference in its entirety. In other embodiments of the present invention, one may employ scanning modules capable of reading both 1-D and 2-D type bar code symbols.

In order to indicate that a particular printed publication or object bears a URL-encoded bar code symbol according to the present invention, and not a conventional bar code symbol (e.g., UPC Symbol), it may be advantageous to print the entire or primary portion of the encoded URL (e.g., http://www.metrologic.com) about the perimeters of the URL-encoded bar code symbol, in a similar way that UPC numbers are printed below UPC-type bar code symbols. This printing convention, once adopted, will help consumers determine which bar code symbols provide "Internet Access", in contrast with other types of bar code symbols.

In instances where the character string length of the URLs becomes long, particularly in connection with information resources that are stored in very-large Web-based database management systems (DBMS), it may be desirable to pre-encode the URLs (to shorten their character string length) prior to encoding the URL within the bar code symbology being employed.

In the illustrative embodiments of the present invention disclosure, the exemplary information resources have been indicated as being stored within WWW-based information servers (i.e. Web Servers), and thus, the character substring "http://www." has been included with the URL for each such information resource in accordance with the syntactical requirements of URL specification and HTTP. It is understood, however, that URL-encoded bar code symbols according to the present invention may also refer (i.e., point) to information resources stored on any type of Internet information server (e.g., a FTP information server) accessible through an Internet browser or communication program of an Internet Access System of the present invention.

The bar code-driven Internet Access System of the present invention can be applied in numerous ways to make life easier at home, in the office, and at school. For example, the present invention can be used to construct a Web-based Package Routing, Tracking and Delivery System shown in FIGS. **8** through **16** of the drawings.

Overview Of The Web-Based Package Routing, Tracking and Delivery (RTD) System Hereof

As shown in FIG. **8**, the web-based package routing, tracking and delivery (RTD) system of illustrative embodiment generally indicated by reference number **50** comprises a plurality of system components, namely: globally-based digital telecommunications network (such as the Internet) **1** providing an infrastructure described hereinabove including ISPs, NSPS, routers, telecommunication lines and channels and the like; one or more data-synchronized Package Routing, Tracking, and Delivery (RTD) Internet Servers **51** connected to the Internet by way of the Internet infrastructure; one or more Package Log-In/Shipping (Computer-Based) Subsystems **52'**, **52"** and **52'"** (generically indicated as **52**), located at different shipping locations throughout the world, and operably connected to the Internet by way of the Internet infrastructure; a plurality of Package Routing (Computer) Subsystems **53'**, **53"**, **53'"** (generically indicated as **53**) located at remote hub stations of the RTD system and connected to the RTD Internet Servers by way of the Internet infrastructure; and a plurality of Portable Package Delivery (PPD) Computer-Based Subsystems (e.g., integrated scanning terminals) **54'**, **54'**, **54'"** (generically indicated as **54**) in wireless digital communication with the RTD Internet Servers by way of the Internet infrastructure. Each of these subsystems will be described in greater detail below. Thereafter, the operation of the RTD system of the present invention will be described.

The Package Log-In/Shipping Computer Subsystem

As shown in FIG. **9**, each Package Log-In/Shipping Subsystem **52** is realized as either a desktop or portable Internet Access Terminal of the present invention shown in FIGS. **1**, **2**, or **3** and described above. The function of the Package Log-In/Shipping Subsystem **52** is to log-in each package with a relational database management system (RDBMS) maintained within or behind the RTD Internet Server **51** of the system. As will be described in greater detail hereinafter, this log-in procedure involves: (1) accessing a RTD Internet Server **51** by reading a particular predesignated URL-encoded bar code symbol specifying its address on the Internet; (2) entering package-related information into the system by way of the Internet; (3) creating and printing a custom bar code symbol label encoded with the URL (and Zip-Code) and an address label bearing the name and address of the entity to whom the package is to be delivered; and (4) applying the bar code label and address to the package prior to shipping for carrying out routing, tracking and delivery functions.

The RTD Internet Server Subsystem

As shown in FIG. **11**, each data-synchronized RTD Internet Server **51** of the illustrative is realized by, for example, a PowerMac 8550/200 Internet Server from Apple Computer, Inc., an Origin 200 Server from Silicon Graphics, Inc., or any other Internet server running: (1) HTTP server software (e.g., Netscape Enterprise Server software from Netscape Communications, Inc., or WebStar® Server software from StarNine, Inc.); (2) Common Gateway Interface (CGI) software (e.g., Tango from Everyware Development Corp.); (3) relational database management system (RDBMS) software (e.g., 4D Version 6.0 from ACI US, Inc.); and (4) website development software (e.g., PageMill from Abode, Inc.) for website design and creation. In a conventional manner, each Internet RTD Server is assigned a unique static IP address and a common domain name on the Internet's Domain Name System.

The RDBMS software (e.g., 4D Version 6.0 from ACI US, Inc.) is used to construct a RDBMS **55** within or at the back-end of each Internet RTD Server **51**. As shown in FIG. **11B**, the RDBMS **51** is used to maintain a hypermedia-type relational database containing package shipping, tracking and delivery related information. As shown in FIG. **11B**, each database record (i.e., RTD information record) maintained for each package logged-into the system comprises a number of information fields, namely: a URL Field **55A**, for storing the URL assigned to each package, at which a static information storage location resides on a web-page on the RTD Internet Server **51**; a Package Identification Field **55B** for storing a unique number assigned to each package being routed, tracked and delivered within the RTD system hereof; a Shipper Identification Number Field **55C** for storing an identifying number assigned to each shipper authorized to ship packages within the RTD system; a Destination Information Field **55D** for storing information describing the (initially, past and currently specified) destination(s) of the

package; a Zip Code Information Field **55**E for storing Zip Code information on the package destination; a Package Content Information Field **55**F for storing information regarding the contents of the package; a Delivery Instructions Field **55**G for storing delivery instructions (e.g., including graphical maps, audio-based delivery instructions, etc.) for use in delivering the package to its destination; a Date of Log-In Field **55**H for storing the date the package is logged-in with the system; a Date of Shipping Field **55**I for storing the date the package was shipped (or is expected to be shipped) within the system; a Date of Delivery Field **55**J for storing the date the package was delivered (or is expected to be delivered) to its destination; a Package "Goto" Field **55**K for storing information on the location of the package within the RTD system; a Time/Date of "Goto" Field **55**L for storing information on the time and date of the tracked location of the package within the RTD system; a Shipping Route Field **55**M for storing information specifying the planned route of travel assigned to end logged-in package; and Other Information Fields **55**N, **550** and **55**P for storing various items of information relating to the package description, shipping, tracking and delivery.

In order that each subsystem **52**, **53** and **54** can connect with RTD Server **51** and access the RTD information record associated with any package logged-in with the system, the following measures are taken: (1) each logged-in package **56** is labelled with a URL-encoded bar code symbol **57** having an information field structure shown in FIG. **12**, as well as a conventional name/address label; and (2) the URL encoded within the bar code symbol is used to specify the location of an information storage field **58** represented on a statically-defined HTML-encoded information field **59** on a web-page stored on the RTD Information Server **51** and served to client subsystems by HTTP Server **60**. The size of each Web-based information storage field **58** is sufficient to store ASCII information describing the unique product identification number assigned to the corresponding product being routed and **10** tracked within the system. The RTD information record in the RDBMS **55** associated with any particular package is linked to the URL by the product identification number stored at the information field specified by the URL. The CGI **61** realized aboard RTD Server **51** (1) translates the product identification number (stored on Web-page **59** at URL **58**) into an SQL-type request for the information elements associated with the corresponding RTD information record stored in the RDBMS **55**, and (2) converts such retrieved information elements into an HTML-encoded web-page conveniently formatted for display on the display screen of the requesting client system **52**, **53** and/or **54**. A Web-page composition program, such as Adobe® PageMill, BBEdit®, or any other HTML editing program, can be used to create HTLM-encoded pages **59** for representing statically-defined information storage locations **58** specified by URLs that are ultimately assigned to package identification numbers used within the RTD system. Such Web-paged based information structures can be accessed: (1) using the Package Log-In/Shipping Computer **52** during and after package log-in, (2) using the PPD Computer **54** during package delivery, and/or (3) using any Internet browser program authorized accessed to information fields within the RDBMS of the RTD Internet Server **51**.

The Package Routing Subsystem

As shown in FIG. **13**, each hub within the RTD system will typically have a number of Package Routing Subsystems **53** located along a high-speed conveyor belt subsystem. The function of each Package Routing Subsystem is to sort and route packages to collection stations within the hub, from which they are then transported to the next location along a route terminating at the final destination specified for the package. In the US Postal System, and United Parcel Service (UPS) system, t he package destination is specified by the ZIP CODE of the destination address. In the illustrative embodiment, each Package Routing Subsystem **53** comprises a number of subcomponents, namely: a Metrologic Holotrak™ laser-scanning holographic bar code symbol reader **53**A, as taught in copenmling application Ser. No. 08/573,949 filed Dec. 18, 1995, incorporated herein by reference in its entirety; an In ternet Access Terminal as disclosed in FIGS. **1** and **2** and described in detail above, connected to an ISP within the infrastructure of the Internet, and transmitting package trackin information (e.g., Package Routing Subsystem identification number, and time and date of routing operation, etc.) to the Web-page based information storage location specified by the package's assigned URL; package routing machine y **53**B for routing packages along a conveyor pathway that passes through the Routing Subsystem, and terminates within at a collection station, from which the package will be shipped along a route that eventually terminates at the package's destination address; and a subsystem controller **53**C for controlling the operation of the package routing machinery **53**B in response to ZIP CODE information produced from the bar code symbol reader **53**A during each package scanning operation.

The Portable Package Delivery (PPD) Subsystem

As illustrated in FIG. **15**, each PPD subsystem **54** is preferably realized as a transportable device of the type shown in FIG. **13** and described in detail above. The function of each PPD subsystem **54** is to provide wireless access to the RDBMS of the RTD Internet Server **51** during package delivery operations. Using portable Internet Access Terminal **54**, the delivery person can automatically connect with the RTD Internet Server Subsystem **51** and access the corresponding RTD information file maintained (within the RDBMS thereof) on any particular package within the system by simply reading the URL-encoded bar code symbol. Such accessible information can include multimedia-type information pertaining to: package content specifications; package shipping information, package delivery instructions (e.g., date, time and location of delivery; shipping and handling terms; audio and/or audio visual messages associated with a particular shipped package; etc. By virtue of the fact that RTD information records are linked with URLs within the RTD Server Subsystem, any information element within a RTD information record can be dynamically changed, updated or deleted while its corresponding package or parcel is in transit through the RTD system. Consequently, shipping instructions (e.g., shipping address, shipping time and date, and recipient) can be dynamically changed after the package has been shipped and is in route to its destination. Such flexibility is prohibited when using preprinted 2-D bar code symbols inherently containing information that is statically-encoded at the time of package log-in/shipment.

Operation of The Web-Based Package RTD System

As indicated at Block A of FIG. **12**, the package log-on/shipping procedure begins by assigning a package identification number (PIN) to the package to be logged-into the RTD system of the present invention. This procedure involves the use of the Package Log-In/Shipping Computer Subsystem **52** illustrated in FIG. **9** and the RTD Internet Server Subsystem **51** shown in FIG. **11**. The request for a new package identification number is transmitted from the Package Log-In/Shipping Computer **52** to the RTD Internet

Server **51** using electronic forms sent by way of HTTP well known in the Internet art. Then at Block B, the Package Log-in/Shipping Computer **52** is used to send the identified destination ZIP CODE for the package to the RTD Server **51**. At Block C, the RTD Server assigns the package (and thus the package identification number) a unique HTML-encoded information storage location on a web-page of the RTD Internet Server and then links the URL of this information storage location with the package identification number. Then at Block D, the Package Log-In/Shipping Computer **52** encodes the URL and the ZIP CODE (associated with the package identification number) within a bar code symbol information structure of either 1-D or 2-D bar code symbology, and then prints out the bar code symbol on a label. Then at Block E, the printed bar code label is applied to the package, and thereafter the Package Log-In/Shipping Computer **52** transmits a confirmation request to the RTD Internet Server **51** confirming entry of the package identification number, Zip Code and URL assigned thereto into the RDBMS of the System. As indicated at Block F, upon receiving confirmation from the RTD Internet Server **51** that such information elements are recorded in the RDBMS, the labelled package is released for shipment to its destination by way of a shipping route available within the RTD system. The above procedure is repeated for each and every package that is to be shipped using the system.

As each package is transported through the RTD system, it is moved through one or more Package Routing Subsystems, as shown in FIG. **13**. As each package is scanned by the bar code symbol reader **53A** at a Package Routing Subsystem, a package routing/tracking procedure is automatically carried out. This procedure is outline in the flow chart of FIG. **14** described below.

As indicated at Block A of FIG. **14**, the bar code scanner at the Package Routing Subsystem reads the URL/ZIP-CODE encoded bar code symbol on the package and obtains the information representative of the URL and the Zip Code. Then, at Block B, the Package Routing Subsystem uses the locally-recovered Zip Code to route the package at the Package Routing Subsystem at the hub station of the system. Then at Block C, the Routing Subsystem uses the obtained URL to access the RTD Internet Server by way of HTTP and update the location of the scanned package within the RDBMS of the system. Each time the package is scanned at a different Package Routing Subsystem, or other Internet Access Terminal located within the RTD system, the current location of the scanned package within the System is updated, by ensuring that each HTTP request sent to the RTD Internet Server (by the Package Routing Subsystem) includes information identifying the requesting Package Routing Subsystem.

When the package finally arrives at the hub nearest its destination, it typically is loaded upon a truck or like vehicle for delivery. Then it is delivered to its destination according to the delivery procedure described generally in the flow chart of FIG. **18** and described below.

As indicated at Block A of FIG. **16**, the delivery person uses the Portable Delivery Computer **54** hereof to read the URL/ZIP-CODE encoded label on the package in order to recover the URL encoded therein. The Portable Delivery Computer can be mounted within the delivery vehicle or held in the hand of the delivery person. As indicated at Block B, the Portable Delivery Computer automatically connects to the RTD Internet Server **51** by way of HTTP using the locally recovered URL encoded in the scanned bar code symbol. As indicated at Block C, the information elements shown in FIG. **11B**, that are associated with the RDBMS information record linked to the URL, are automatically displayed on the display screen of the Package Delivery Computer **53**. Such information, particularly the package delivery instructions, are then used to deliver the package to its destination. Such information can be of a multimedia nature, including audio instructions and graphical images of delivery maps to facilitate the delivery process.

In the illustrative embodiment of the RTD system described above, packages being shipped within the system have been labelled with bar code symbols that have been encoded with both URL and ZIP-CODE information. The reason that ZIP CODE information is encoded in the bar code symbol (along with the URL) is that the ZIP CODE can be locally recovered very quickly at a Package Routing Subsystem **53** and used to route packages moving along the conveyor belt system at high speeds. Alternatively, however, the locally recovered URL can be used to connect to the RTD Internet Server **51**, access its RDBMS, and acquire the ZIP CODE of any particular package that has been scanned by the Package Routing Subsystem. However, as the time required to access such information from the RTD Internet Server **51** typically will be greater than the residency time of the package moving through the Package Routing Subsystem, it will be desirable in many instances to use a locally recovered ZIP CODE to carry out package routing operations described hereinabove.

In an alternative embodiment of the present invention, the URL and the ZIP-CODE can be encoded in separate bar code symbol information structures, as indicated in FIG. **10B**. The bar code symbols of this composite information structure can be placed side by side, stacked above and below one another, or randomly on the surface(s) of the package.

In either of the illustrative embodiments of the RTD system described, an improved method of globally routing, tracking and delivering packages, parcels and objects alike is provided. At the same time, this system avoids the shortcomings and drawbacks associated with the use of statically-encoded 2-D bar code symbols and prior art integrated scanning terminals for reading the same. Unlike 2-D bar code symbols, the RTD system of the present invention can be used to provide multi-media instructions to delivery personnel to improve package delivery operations worldwide. Also, audio-visual messages, linked to a particular package, can be stored on the RTD Internet Server **51** by the sender of the package and delivered to the package Recipient at the time of delivery, to provide a "singing or voice telegram" type message along with the package. The point of delivery message can also provide images and short video clips for visual display to enhance the package delivery process in ways unattainable using prior art delivery techniques. optionally, such multi-media messages can be downloaded from the Portable Package Delivery Subsystem **54** onto an information storage device (e.g., floppy disc, ZIP® 100 Megabyte storage device from Iomega, Inc., etc.) and delivered with an accompanying parcel at the point of delivery.

The RTD System of the present invention can be modified to provide a web-based Document Tracking and Delivery System for use within various types of organizations. In such an alternative embodiment of the present invention, a Document Log-In Computer Subsystem, similar to the Subsystem of FIG. **9**, would be used to log-in documents with the System. There would be no need for a Package Routing Subsystem, as employed in the system of FIG. **8**, nor the use of URL/ZIP-CODE encoded bar code symbols. Rather, URL-encoded bar code symbols of the type shown in FIGS.

1C(1), 1C(2), 1D(1) or 1D(2) would be placed on documents being tracked within the system. Also, a web-based Document Tracking and Delivery Server, similar to the RTD Server of FIG. **11**, would be used to store document tracking and delivery information, as well as information (including e-mail messages sent to others within the organization) pertaining to the document as it is received by others within the system. An advantage of such a system would be that hard-copy documents can be circulated within an organization, and those wishing to comment on them can quickly access the Document Tracking/Delivery Server by reading the printer URL-encoded bar code symbol on it, in order to append messages and notes to the database records associated with the document, and allow others along the review chain to follow all that has occurred. Documents to be tracked within the system can be physical specimens, drawings, 3-D articles, letters, memos, photographs and the like.

In other embodiments of the present invention, URL-encoded bar code symbols can be printed on diverse types of objects, articles or products in order to enable users to access information resources in the Internet, relating to such URL-encoded objects, articles and products, by scanning such URL-encoded bar code symbols using the programmed bar code symbol readers of the present invention.

It is understood that the Internet Access System of the illustrative embodiments may be modified in a variety of ways in order to carry out the various aspects of the present invention. All such modifications and variations of the illustrative embodiments thereof are deemed to be within the scope and spirit of the present invention as defined by the accompanying Claims to Invention.

What is claimed is:

1. A system for routing, tracking and delivering packages from a shipping point to a plurality of destination points, comprising:

a Routing, Tracking and Delivery (RTD) Internet Server connected to the Internet infrastructure, for storing package delivery information and package tracking information on each package logged-in with said system;

a Package Log-In/Shipping Computer Subsystem located at a shipping location and operable connectable to said RTD Internet Server by way of the Internet infrastructure, for entering package delivery information and package tracking information on each package logged-in with said system, and producing a URL/ZIP-CODE encoded bar code symbol for application to each said package being logged-in with said system;

a plurality of Package Routing Subsystems located at remote hub stations and connectable to said RTD Internet Server by way of the Internet infrastructure, for scanning URL/ZIP-CODE encoded bar code symbols applied to said packages and generating package tracking information, and transmitting said package tracking information to said RTD Internet Server, and routing said packages within said system using at least a portion of said package tracking information; and

a plurality of mobile Package Delivery Computer Subsystems operably connectable to said Internet Server by way of the Internet infrastructure, for accessing package delivery information served therefrom, wherein each mobile Package Delivery Computer Subsystem is capable of reading said URL/ZIP-Code encoded bar-code symbol on any of said plurality of packages so as to access package delivery information from said RTD Internet Server.

2. The system of claim **1**, wherein said RTD Internet Server comprises:

a relational database management system (RDBMS) for storing package delivery information and package tracking information on each package logged-in with said system;

an HTTP Server for serving HTML-encoded web-pages having URL-specified information storage fields represented therein, each said URL-specified information storage field being linked to one said package logged-in with said system; and

an Interface for interfacing said RDBMS with said HTTP Server.

3. The system of claim **1**, wherein said RDBMS contains information elements that are related to an information storage location in an HTML-encoded web-page which is specified by a Uniform Resource Locator (URL) that has been uniquely assigned to a particular package being tracked within said system.

4. The system of claim **1**, wherein said Package Log-In/Shipping Computer Subsystem comprises a desktop computer system for entering package delivery information and a bar code symbol printer for printing URL/ZIP-Code encoded barcode symbols.

5. The system of claim **1**, wherein each said Package Delivery Computer Subsystem comprises a portable scanning terminal programmed to automatically connect to said Internet Server upon reading one said URL/ZIP-CODE encoded bar code symbol.

6. A method of routing, tracking and delivering packages from a shipping point to a destination point, comprising the steps of:

(a) at said shipping point applying a URL/ZIP-CODE encoded bar code symbol to each package being tracked within a package routing/tracking and delivery (RTD) system having an Internet Server storing package delivery information;

(b) reading said URL/ZIP-CODE encoded bar code symbol on each said package at different locations within said RTD system in order to track the position of said package therein and facilitate routing operations within said RTD system; and

(c) reading said URL/ZIP-CODE encoded bar code symbol on each said package using a portable scanning terminal in operable communication with said Internet Server in order to access package delivery information from said Internet Server, for display on said portable scanning terminal and use in delivering said package to its destination point.

7. A system for tracking package and linking information thereto, said system comprising:

an Internet Information Server connected to the Internet infrastructure, for storing package tracking information on each package logged-in within said system;

a Log-In Computer Subsystem for entering package identifying information into the Internet Information Server in order to log-in each package to be tracked within said system, and producing a printed URL encoded bar code symbol for application to each said package being logged-in within said system; and

a plurality of Mobile Client Computer Subsystems connectable to said Internet Information Server by way of the Internet infrastructure, for reading a printed URL encoded barcode symbol applied to a package, connecting to said Internet Information Server, and accessing therefrom package-related information maintained on each package being tracked by said system.

8. The system of claim 7, wherein said Internet Information Server comprises:

a relational database management system (RDBMS) for storing object tracking information on each package logged-in within said system;

an HTTP Server for serving HTML-encoded web-pages having URL-specified information storage fields represented therein, each said URL-specified information storage field being linked to one said package logged-in with said system; and

a software-based interface for interfacing said RDBMS with said HTTP Server.

9. The system of claim 8, wherein said RDBMS contains information elements that are related to an information storage location in an HTML-encoded web-page which is specified by a Uniform Resource Locator (URL) that has been uniquely assigned to a particular package being tracked within said system.

10. The system of claim 7, wherein said Log-In Computer Subsystem comprises a desktop computer system and bar code symbol printer.

11. A Web-based package routing, tracking and delivery system, comprising:

one or more Routing, Tracking and Delivery (RTD) Internet Server Subsystems are connected to the Internet for maintaining and serving package related information produced by either (i) a Package Log-In/Shipping Subsystem located at a product shipping location and connected to said RTD Internet Server by a first data communication link, (ii) a Package Routing Subsystem located at a hub station and connected to said RTD Internet Server Subsystem by a second data communication link, or (iii) a Portable Package Delivery Subsystem carried by a package delivery person and operably connected to said RTD Internet Server Subsystem by a wireless data communication link.

12. A Web-based package routing, tracking and delivery system comprising a plurality of remote hub stations, wherein each remote hub station within the system further comprises:

a first mechanism for reading URL-encoded bar code symbols on a package;

a second mechanism for recovering the URL encoded in the bar code symbol at said hub station; and

a third mechanism for updating the location of said package within said system using said recovered URL.

13. The Web-based package routing, tracking and delivery system of claim 12, which further comprises means for reading said encoded bar code symbol using a portable Internet access terminal, and recovering the URL-encoded therein.

* * * * *

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NOTE: Where it is feasible, a syllabus (headnote) will be released, as is being done in connection with this case, at the time the opinion is issued. The syllabus constitutes no part of the opinion of the Court but has been prepared by the Reporter of Decisions for the convenience of the reader. See *United States* v. *Detroit Timber & Lumber Co.*, 200 U. S. 321, 337.

SUPREME COURT OF THE UNITED STATES

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KSR INTERNATIONAL CO. *v.* TELEFLEX INC. ET AL.

CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

No. 04–1350. Argued November 28, 2006—Decided April 30, 2007

To control a conventional automobile's speed, the driver depresses or releases the gas pedal, which interacts with the throttle via a cable or other mechanical link. Because the pedal's position in the footwell normally cannot be adjusted, a driver wishing to be closer or farther from it must either reposition himself in the seat or move the seat, both of which can be imperfect solutions for smaller drivers in cars with deep footwells. This prompted inventors to design and patent pedals that could be adjusted to change their locations. The Asano patent reveals a support structure whereby, when the pedal location is adjusted, one of the pedal's pivot points stays fixed. Asano is also designed so that the force necessary to depress the pedal is the same regardless of location adjustments. The Redding patent reveals a different, sliding mechanism where both the pedal and the pivot point are adjusted.

In newer cars, computer-controlled throttles do not operate through force transferred from the pedal by a mechanical link, but open and close valves in response to electronic signals. For the computer to know what is happening with the pedal, an electronic sensor must translate the mechanical operation into digital data. Inventors had obtained a number of patents for such sensors. The so-called '936 patent taught that it was preferable to detect the pedal's position in the pedal mechanism, not in the engine, so the patent disclosed a pedal with an electronic sensor on a pivot point in the pedal assembly. The Smith patent taught that to prevent the wires connecting the sensor to the computer from chafing and wearing out, the sensor should be put on a fixed part of the pedal assembly rather than in or on the pedal's footpad. Inventors had also patented self-contained modular sensors, which can be taken off the shelf and attached to any

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mechanical pedal to allow it to function with a computer-controlled throttle. The '068 patent disclosed one such sensor. Chevrolet also manufactured trucks using modular sensors attached to the pedal support bracket, adjacent to the pedal and engaged with the pivot shaft about which the pedal rotates. Other patents disclose electronic sensors attached to adjustable pedal assemblies. For example, the Rixon patent locates the sensor in the pedal footpad, but is known for wire chafing.

After petitioner KSR developed an adjustable pedal system for cars with cable-actuated throttles and obtained its '976 patent for the design, General Motors Corporation (GMC) chose KSR to supply adjustable pedal systems for trucks using computer-controlled throttles. To make the '976 pedal compatible with the trucks, KSR added a modular sensor to its design. Respondents (Teleflex) hold the exclusive license for the Engelgau patent, claim 4 of which discloses a position-adjustable pedal assembly with an electronic pedal position sensor attached a fixed pivot point. Despite having denied a similar, broader claim, the U. S. Patent and Trademark Office (PTO) had allowed claim 4 because it included the limitation of a fixed pivot position, which distinguished the design from Redding's. Asano was neither included among the Engelgau patent's prior art references nor mentioned in the patent's prosecution, and the PTO did not have before it an adjustable pedal with a fixed pivot point. After learning of KSR's design for GMC, Teleflex sued for infringement, asserting that KSR's pedal system infringed the Engelgau patent's claim 4. KSR countered that claim 4 was invalid under §103 of the Patent Act, which forbids issuance of a patent when "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art."

Graham v. *John Deere Co. of Kansas City*, 383 U. S. 1, 17–18, set out an objective analysis for applying §103: "[T]he scope and content of the prior art are . . . determined; differences between the prior art and the claims at issue are . . . ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented." While the sequence of these questions might be reordered in any particular case, the factors define the controlling inquiry. However, seeking to resolve the obviousness question with more uniformity and consistency, the Federal Circuit has employed a "teaching, suggestion, or motivation" (TSM) test, under which a pat-

ent claim is only proved obvious if the prior art, the problem's nature, or the knowledge of a person having ordinary skill in the art reveals some motivation or suggestion to combine the prior art teachings.

The District Court granted KSR summary judgment. After reviewing pedal design history, the Engelgau patent's scope, and the relevant prior art, the court considered claim 4's validity, applying *Graham*'s framework to determine whether under summary-judgment standards KSR had demonstrated that claim 4 was obvious. The court found "little difference" between the prior art's teachings and claim 4: Asano taught everything contained in the claim except using a sensor to detect the pedal's position and transmit it to a computer controlling the throttle. That additional aspect was revealed in, *e.g.*, the '068 patent and Chevrolet's sensors. The court then held that KSR satisfied the TSM test, reasoning (1) the state of the industry would lead inevitably to combinations of electronic sensors and adjustable pedals, (2) Rixon provided the basis for these developments, and (3) Smith taught a solution to Rixon's chafing problems by positioning the sensor on the pedal's fixed structure, which could lead to the combination of a pedal like Asano with a pedal position sensor.

Reversing, the Federal Circuit ruled the District Court had not applied the TSM test strictly enough, having failed to make findings as to the specific understanding or principle within a skilled artisan's knowledge that would have motivated one with no knowledge of the invention to attach an electronic control to the Asano assembly's support bracket. The Court of Appeals held that the District Court's recourse to the nature of the problem to be solved was insufficient because, unless the prior art references addressed the precise problem that the patentee was trying to solve, the problem would not motivate an inventor to look at those references. The appeals court found that the Asano pedal was designed to ensure that the force required to depress the pedal is the same no matter how the pedal is adjusted, whereas Engelgau sought to provide a simpler, smaller, cheaper adjustable electronic pedal. The Rixon pedal, said the court, suffered from chafing but was not designed to solve that problem and taught nothing helpful to Engelgau's purpose. Smith, in turn, did not relate to adjustable pedals and did not necessarily go to the issue of motivation to attach the electronic control on the pedal assembly's support bracket. So interpreted, the court held, the patents would not have led a person of ordinary skill to put a sensor on an Asano-like pedal. That it might have been obvious to try that combination was likewise irrelevant. Finally, the court held that genuine issues of material fact precluded summary judgment.

Held: The Federal Circuit addressed the obviousness question in a narrow, rigid manner that is inconsistent with §103 and this Court's

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precedents. KSR provided convincing evidence that mounting an available sensor on a fixed pivot point of the Asano pedal was a design step well within the grasp of a person of ordinary skill in the relevant art and that the benefit of doing so would be obvious. Its arguments, and the record, demonstrate that the Engelgau patent's claim 4 is obvious. Pp. 11–24.

1. *Graham* provided an expansive and flexible approach to the obviousness question that is inconsistent with the way the Federal Circuit applied its TSM test here. Neither §103's enactment nor *Graham*'s analysis disturbed the Court's earlier instructions concerning the need for caution in granting a patent based on the combination of elements found in the prior art. See *Great Atlantic & Pacific Tea Co.* v. *Supermarket Equipment Corp.*, 340 U. S. 147, 152. Such a combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. See, *e.g., United States* v. *Adams*, 383 U. S. 39, 50–52. When a work is available in one field, design incentives and other market forces can prompt variations of it, either in the same field or in another. If a person of ordinary skill in the art can implement a predictable variation, and would see the benefit of doing so, §103 likely bars its patentability. Moreover, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond that person's skill. A court must ask whether the improvement is more than the predictable use of prior-art elements according to their established functions. Following these principles may be difficult if the claimed subject matter involves more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement. To determine whether there was an apparent reason to combine the known elements in the way a patent claims, it will often be necessary to look to interrelated teachings of multiple patents; to the effects of demands known to the design community or present in the marketplace; and to the background knowledge possessed by a person having ordinary skill in the art. To facilitate review, this analysis should be made explicit. But it need not seek out precise teachings directed to the challenged claim's specific subject matter, for a court can consider the inferences and creative steps a person of ordinary skill in the art would employ. Pp. 11–14.

(b) The TSM test captures a helpful insight: A patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art. Although common sense directs caution as to a patent application claiming as

innovation the combination of two known devices according to their established functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the art to combine the elements as the new invention does. Inventions usually rely upon building blocks long since uncovered, and claimed discoveries almost necessarily will be combinations of what, in some sense, is already known. Helpful insights, however, need not become rigid and mandatory formulas. If it is so applied, the TSM test is incompatible with this Court's precedents. The diversity of inventive pursuits and of modern technology counsels against confining the obviousness analysis by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasizing the importance of published articles and the explicit content of issued patents. In many fields there may be little discussion of obvious techniques or combinations, and market demand, rather than scientific literature, may often drive design trends. Granting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, for patents combining previously known elements, deprive prior inventions of their value or utility. Since the TSM test was devised, the Federal Circuit doubtless has applied it in accord with these principles in many cases. There is no necessary inconsistency between the test and the *Graham* analysis. But a court errs where, as here, it transforms general principle into a rigid rule limiting the obviousness inquiry. Pp. 14–15.

(c) The flaws in the Federal Circuit's analysis relate mostly to its narrow conception of the obviousness inquiry consequent in its application of the TSM test. The Circuit first erred in holding that courts and patent examiners should look only to the problem the patentee was trying to solve. Under the correct analysis, any need or problem known in the field and addressed by the patent can provide a reason for combining the elements in the manner claimed. Second, the appeals court erred in assuming that a person of ordinary skill in the art attempting to solve a problem will be led only to those prior art elements designed to solve the same problem. The court wrongly concluded that because Asano's primary purpose was solving the constant ratio problem, an inventor considering how to put a sensor on an adjustable pedal would have no reason to consider putting it on the Asano pedal. It is common sense that familiar items may have obvious uses beyond their primary purposes, and a person of ordinary skill often will be able to fit the teachings of multiple patents together like pieces of a puzzle. Regardless of Asano's primary purpose, it provided an obvious example of an adjustable pedal with a fixed pivot point, and the prior art was replete with patents indicating that such a point was an ideal mount for a sensor. Third, the

court erred in concluding that a patent claim cannot be proved obvious merely by showing that the combination of elements was obvious to try. When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill in the art has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. Finally, the court drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias. Rigid preventative rules that deny recourse to common sense are neither necessary under, nor consistent with, this Court's case law. Pp. 15–18.

2. Application of the foregoing standards demonstrates that claim 4 is obvious. Pp. 18–23.

(a) The Court rejects Teleflex's argument that the Asano pivot mechanism's design prevents its combination with a sensor in the manner claim 4 describes. This argument was not raised before the District Court, and it is unclear whether it was raised before the Federal Circuit. Given the significance of the District Court's finding that combining Asano with a pivot-mounted pedal position sensor fell within claim 4's scope, it is apparent that Teleflex would have made clearer challenges if it intended to preserve this claim. Its failure to clearly raise the argument, and the appeals court's silence on the issue, lead this Court to accept the District Court's conclusion. Pp. 18–20.

(b) The District Court correctly concluded that when Engelgau designed the claim 4 subject matter, it was obvious to a person of ordinary skill in the art to combine Asano with a pivot-mounted pedal position sensor. There then was a marketplace creating a strong incentive to convert mechanical pedals to electronic pedals, and the prior art taught a number of methods for doing so. The Federal Circuit considered the issue too narrowly by, in effect, asking whether a pedal designer writing on a blank slate would have chosen both Asano and a modular sensor similar to the ones used in the Chevrolet trucks and disclosed in the '068 patent. The proper question was whether a pedal designer of ordinary skill in the art, facing the wide range of needs created by developments in the field, would have seen an obvious benefit to upgrading Asano with a sensor. For such a designer starting with Asano, the question was where to attach the sensor. The '936 patent taught the utility of putting the sensor on the pedal device. Smith, in turn, explained not to put the sensor on the pedal footpad, but instead on the structure. And from Rixon's known wire-chafing problems, and Smith's teaching that the pedal assemblies must not precipitate any motion in the connecting wires,

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the designer would know to place the sensor on a nonmoving part of the pedal structure. The most obvious such point is a pivot point. The designer, accordingly, would follow Smith in mounting the sensor there. Just as it was possible to begin with the objective to upgrade Asano to work with a computer-controlled throttle, so too was it possible to take an adjustable electronic pedal like Rixon and seek an improvement that would avoid the wire-chafing problem. Teleflex has not shown anything in the prior art that taught away from the use of Asano, nor any secondary factors to dislodge the determination that claim 4 is obvious. Pp. 20–23.

3. The Court disagrees with the Federal Circuit's holding that genuine issues of material fact precluded summary judgment. The ultimate judgment of obviousness is a legal determination. *Graham*, 383 U. S., at 17. Where, as here, the prior art's content, the patent claim's scope, and the level of ordinary skill in the art are not in material dispute and the claim's obviousness is apparent, summary judgment is appropriate. P. 23.

119 Fed. Appx. 282, reversed and remanded.

KENNEDY, J., delivered the opinion for a unanimous Court.

NOTICE: This opinion is subject to formal revision before publication in the preliminary print of the United States Reports. Readers are requested to notify the Reporter of Decisions, Supreme Court of the United States, Washington, D. C. 20543, of any typographical or other formal errors, in order that corrections may be made before the preliminary print goes to press.

SUPREME COURT OF THE UNITED STATES

No. 04–1350

KSR INTERNATIONAL CO., PETITIONER *v.*
TELEFLEX INC. ET AL.

ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

[April 30, 2007]

JUSTICE KENNEDY delivered the opinion of the Court.

Teleflex Incorporated and its subsidiary Technology Holding Company—both referred to here as Teleflex—sued KSR International Company for patent infringement. The patent at issue, United States Patent No. 6,237,565 B1, is entitled "Adjustable Pedal Assembly With Electronic Throttle Control." Supplemental App. 1. The patentee is Steven J. Engelgau, and the patent is referred to as "the Engelgau patent." Teleflex holds the exclusive license to the patent.

Claim 4 of the Engelgau patent describes a mechanism for combining an electronic sensor with an adjustable automobile pedal so the pedal's position can be transmitted to a computer that controls the throttle in the vehicle's engine. When Teleflex accused KSR of infringing the Engelgau patent by adding an electronic sensor to one of KSR's previously designed pedals, KSR countered that claim 4 was invalid under the Patent Act, 35 U. S. C. §103, because its subject matter was obvious.

Section 103 forbids issuance of a patent when "the differences between the subject matter sought to be pat-

ented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."

In *Graham* v. *John Deere Co. of Kansas City*, 383 U. S. 1 (1966), the Court set out a framework for applying the statutory language of §103, language itself based on the logic of the earlier decision in *Hotchkiss* v. *Greenwood*, 11 How. 248 (1851), and its progeny. See 383 U. S., at 15–17. The analysis is objective:

> "Under §103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented." *Id.*, at 17–18.

While the sequence of these questions might be reordered in any particular case, the factors continue to define the inquiry that controls. If a court, or patent examiner, conducts this analysis and concludes the claimed subject matter was obvious, the claim is invalid under §103.

Seeking to resolve the question of obviousness with more uniformity and consistency, the Court of Appeals for the Federal Circuit has employed an approach referred to by the parties as the "teaching, suggestion, or motivation" test (TSM test), under which a patent claim is only proved obvious if "some motivation or suggestion to combine the prior art teachings" can be found in the prior art, the nature of the problem, or the knowledge of a person having ordinary skill in the art. See, *e.g., Al-Site Corp.* v. *VSI*

Int'l, Inc., 174 F. 3d 1308, 1323–1324 (CA Fed. 1999). KSR challenges that test, or at least its application in this case. See 119 Fed. Appx. 282, 286–290 (CA Fed. 2005). Because the Court of Appeals addressed the question of obviousness in a manner contrary to §103 and our precedents, we granted certiorari, 547 U. S ___ (2006). We now reverse.

I

A

In car engines without computer-controlled throttles, the accelerator pedal interacts with the throttle via cable or other mechanical link. The pedal arm acts as a lever rotating around a pivot point. In a cable-actuated throttle control the rotation caused by pushing down the pedal pulls a cable, which in turn pulls open valves in the carburetor or fuel injection unit. The wider the valves open, the more fuel and air are released, causing combustion to increase and the car to accelerate. When the driver takes his foot off the pedal, the opposite occurs as the cable is released and the valves slide closed.

In the 1990's it became more common to install computers in cars to control engine operation. Computer-controlled throttles open and close valves in response to electronic signals, not through force transferred from the pedal by a mechanical link. Constant, delicate adjustments of air and fuel mixture are possible. The computer's rapid processing of factors beyond the pedal's position improves fuel efficiency and engine performance.

For a computer-controlled throttle to respond to a driver's operation of the car, the computer must know what is happening with the pedal. A cable or mechanical link does not suffice for this purpose; at some point, an electronic sensor is necessary to translate the mechanical operation into digital data the computer can understand.

Before discussing sensors further we turn to the me-

chanical design of the pedal itself. In the traditional design a pedal can be pushed down or released but cannot have its position in the footwell adjusted by sliding the pedal forward or back. As a result, a driver who wishes to be closer or farther from the pedal must either reposition himself in the driver's seat or move the seat in some way. In cars with deep footwells these are imperfect solutions for drivers of smaller stature. To solve the problem, inventors, beginning in the 1970's, designed pedals that could be adjusted to change their location in the footwell. Important for this case are two adjustable pedals disclosed in U. S. Patent Nos. 5,010,782 (filed July 28, 1989) (Asano) and 5,460,061 (filed Sept. 17, 1993) (Redding). The Asano patent reveals a support structure that houses the pedal so that even when the pedal location is adjusted relative to the driver, one of the pedal's pivot points stays fixed. The pedal is also designed so that the force necessary to push the pedal down is the same regardless of adjustments to its location. The Redding patent reveals a different, sliding mechanism where both the pedal and the pivot point are adjusted.

We return to sensors. Well before Engelgau applied for his challenged patent, some inventors had obtained patents involving electronic pedal sensors for computer-controlled throttles. These inventions, such as the device disclosed in U. S. Patent No. 5,241,936 (filed Sept. 9, 1991) ('936), taught that it was preferable to detect the pedal's position in the pedal assembly, not in the engine. The '936 patent disclosed a pedal with an electronic sensor on a pivot point in the pedal assembly. U. S. Patent No. 5,063,811 (filed July 9, 1990) (Smith) taught that to prevent the wires connecting the sensor to the computer from chafing and wearing out, and to avoid grime and damage from the driver's foot, the sensor should be put on a fixed part of the pedal assembly rather than in or on the pedal's footpad.

In addition to patents for pedals with integrated sensors inventors obtained patents for self-contained modular sensors. A modular sensor is designed independently of a given pedal so that it can be taken off the shelf and attached to mechanical pedals of various sorts, enabling the pedals to be used in automobiles with computer-controlled throttles. One such sensor was disclosed in U. S. Patent No. 5,385,068 (filed Dec. 18, 1992) ('068). In 1994, Chevrolet manufactured a line of trucks using modular sensors "attached to the pedal support bracket, adjacent to the pedal and engaged with the pivot shaft about which the pedal rotates in operation." 298 F. Supp. 2d 581, 589 (ED Mich. 2003).

The prior art contained patents involving the placement of sensors on adjustable pedals as well. For example, U. S. Patent No. 5,819,593 (filed Aug. 17, 1995) (Rixon) discloses an adjustable pedal assembly with an electronic sensor for detecting the pedal's position. In the Rixon pedal the sensor is located in the pedal footpad. The Rixon pedal was known to suffer from wire chafing when the pedal was depressed and released.

This short account of pedal and sensor technology leads to the instant case.

B

KSR, a Canadian company, manufactures and supplies auto parts, including pedal systems. Ford Motor Company hired KSR in 1998 to supply an adjustable pedal system for various lines of automobiles with cable-actuated throttle controls. KSR developed an adjustable mechanical pedal for Ford and obtained U. S. Patent No. 6,151,976 (filed July 16, 1999) ('976) for the design. In 2000, KSR was chosen by General Motors Corporation (GMC or GM) to supply adjustable pedal systems for Chevrolet and GMC light trucks that used engines with computer-controlled throttles. To make the '976 pedal compatible with the

trucks, KSR merely took that design and added a modular sensor.

Teleflex is a rival to KSR in the design and manufacture of adjustable pedals. As noted, it is the exclusive licensee of the Engelgau patent. Engelgau filed the patent application on August 22, 2000 as a continuation of a previous application for U. S. Patent No. 6,109,241, which was filed on January 26, 1999. He has sworn he invented the patent's subject matter on February 14, 1998. The Engelgau patent discloses an adjustable electronic pedal described in the specification as a "simplified vehicle control pedal assembly that is less expensive, and which uses fewer parts and is easier to package within the vehicle." Engelgau, col. 2, lines 2–5, Supplemental App. 6. Claim 4 of the patent, at issue here, describes:

> "A vehicle control pedal apparatus comprising:
>
> a support adapted to be mounted to a vehicle structure;
>
> an adjustable pedal assembly having a pedal arm moveable in for[e] and aft directions with respect to said support;
>
> a pivot for pivotally supporting said adjustable pedal assembly with respect to said support and defining a pivot axis; and
>
> an electronic control attached to said support for controlling a vehicle system;
>
> said apparatus characterized by said electronic control being responsive to said pivot for providing a signal that corresponds to pedal arm position as said pedal arm pivots about said pivot axis between rest and applied positions wherein the position of said pivot remains constant while said pedal arm moves in fore and aft directions with respect to said pivot." *Id.,* col.

6, lines 17–36, Supplemental App. 8 (diagram numbers omitted).

We agree with the District Court that the claim discloses "a position-adjustable pedal assembly with an electronic pedal position sensor attached to the support member of the pedal assembly. Attaching the sensor to the support member allows the sensor to remain in a fixed position while the driver adjusts the pedal." 298 F. Supp. 2d, at 586–587.

Before issuing the Engelgau patent the U. S. Patent and Trademark Office (PTO) rejected one of the patent claims that was similar to, but broader than, the present claim 4. The claim did not include the requirement that the sensor be placed on a fixed pivot point. The PTO concluded the claim was an obvious combination of the prior art disclosed in Redding and Smith, explaining:

> "'Since the prior ar[t] references are from the field of endeavor, the purpose disclosed . . . would have been recognized in the pertinent art of Redding. Therefore it would have been obvious . . . to provide the device of Redding with the . . . means attached to a support member as taught by Smith.'" *Id.*, at 595.

In other words Redding provided an example of an adjustable pedal and Smith explained how to mount a sensor on a pedal's support structure, and the rejected patent claim merely put these two teachings together.

Although the broader claim was rejected, claim 4 was later allowed because it included the limitation of a fixed pivot point, which distinguished the design from Redding's. *Ibid.* Engelgau had not included Asano among the prior art references, and Asano was not mentioned in the patent's prosecution. Thus, the PTO did not have before it an adjustable pedal with a fixed pivot point. The patent issued on May 29, 2001 and was assigned to Teleflex.

Upon learning of KSR's design for GM, Teleflex sent a

warning letter informing KSR that its proposal would violate the Engelgau patent. "'Teleflex believes that any supplier of a product that combines an adjustable pedal with an electronic throttle control necessarily employs technology covered by one or more'" of Teleflex's patents. *Id.*, at 585. KSR refused to enter a royalty arrangement with Teleflex; so Teleflex sued for infringement, asserting KSR's pedal infringed the Engelgau patent and two other patents. *Ibid.* Teleflex later abandoned its claims regarding the other patents and dedicated the patents to the public. The remaining contention was that KSR's pedal system for GM infringed claim 4 of the Engelgau patent. Teleflex has not argued that the other three claims of the patent are infringed by KSR's pedal, nor has Teleflex argued that the mechanical adjustable pedal designed by KSR for Ford infringed any of its patents.

C

The District Court granted summary judgment in KSR's favor. After reviewing the pertinent history of pedal design, the scope of the Engelgau patent, and the relevant prior art, the court considered the validity of the contested claim. By direction of 35 U. S. C. §282, an issued patent is presumed valid. The District Court applied *Graham*'s framework to determine whether under summary-judgment standards KSR had overcome the presumption and demonstrated that claim 4 was obvious in light of the prior art in existence when the claimed subject matter was invented. See §102(a).

The District Court determined, in light of the expert testimony and the parties' stipulations, that the level of ordinary skill in pedal design was "'an undergraduate degree in mechanical engineering (or an equivalent amount of industry experience) [and] familiarity with pedal control systems for vehicles.'" 298 F. Supp. 2d, at 590. The court then set forth the relevant prior art, in-

cluding the patents and pedal designs described above.

Following *Graham*'s direction, the court compared the teachings of the prior art to the claims of Engelgau. It found "little difference." 298 F. Supp. 2d, at 590. Asano taught everything contained in claim 4 except the use of a sensor to detect the pedal's position and transmit it to the computer controlling the throttle. That additional aspect was revealed in sources such as the '068 patent and the sensors used by Chevrolet.

Under the controlling cases from the Court of Appeals for the Federal Circuit, however, the District Court was not permitted to stop there. The court was required also to apply the TSM test. The District Court held KSR had satisfied the test. It reasoned (1) the state of the industry would lead inevitably to combinations of electronic sensors and adjustable pedals, (2) Rixon provided the basis for these developments, and (3) Smith taught a solution to the wire chafing problems in Rixon, namely locating the sensor on the fixed structure of the pedal. This could lead to the combination of Asano, or a pedal like it, with a pedal position sensor.

The conclusion that the Engelgau design was obvious was supported, in the District Court's view, by the PTO's rejection of the broader version of claim 4. Had Engelgau included Asano in his patent application, it reasoned, the PTO would have found claim 4 to be an obvious combination of Asano and Smith, as it had found the broader version an obvious combination of Redding and Smith. As a final matter, the District Court held that the secondary factor of Teleflex's commercial success with pedals based on Engelgau's design did not alter its conclusion. The District Court granted summary judgment for KSR.

With principal reliance on the TSM test, the Court of Appeals reversed. It ruled the District Court had not been strict enough in applying the test, having failed to make "'finding[s] as to the specific understanding or principle

within the knowledge of a skilled artisan that would have motivated one with no knowledge of [the] invention' . . . to attach an electronic control to the support bracket of the Asano assembly." 119 Fed. Appx., at 288 (brackets in original) (quoting *In re Kotzab*, 217 F. 3d 1365, 1371 (CA Fed. 2000)). The Court of Appeals held that the District Court was incorrect that the nature of the problem to be solved satisfied this requirement because unless the "prior art references address[ed] the precise problem that the patentee was trying to solve," the problem would not motivate an inventor to look at those references. 119 Fed. Appx., at 288.

Here, the Court of Appeals found, the Asano pedal was designed to solve the "'constant ratio problem'"—that is, to ensure that the force required to depress the pedal is the same no matter how the pedal is adjusted—whereas Engelgau sought to provide a simpler, smaller, cheaper adjustable electronic pedal. *Ibid.* As for Rixon, the court explained, that pedal suffered from the problem of wire chafing but was not designed to solve it. In the court's view Rixon did not teach anything helpful to Engelgau's purpose. Smith, in turn, did not relate to adjustable pedals and did not "necessarily go to the issue of motivation to attach the electronic control on the support bracket of the pedal assembly." *Ibid.* When the patents were interpreted in this way, the Court of Appeals held, they would not have led a person of ordinary skill to put a sensor on the sort of pedal described in Asano.

That it might have been obvious to try the combination of Asano and a sensor was likewise irrelevant, in the court's view, because "'"[o]bvious to try" has long been held not to constitute obviousness.'" *Id.*, at 289 (quoting *In re Deuel*, 51 F. 3d 1552, 1559 (CA Fed. 1995)).

The Court of Appeals also faulted the District Court's consideration of the PTO's rejection of the broader version of claim 4. The District Court's role, the Court of Appeals

explained, was not to speculate regarding what the PTO might have done had the Engelgau patent mentioned Asano. Rather, the court held, the District Court was obliged first to presume that the issued patent was valid and then to render its own independent judgment of obviousness based on a review of the prior art. The fact that the PTO had rejected the broader version of claim 4, the Court of Appeals said, had no place in that analysis.

The Court of Appeals further held that genuine issues of material fact precluded summary judgment. Teleflex had proffered statements from one expert that claim 4 "'was a simple, elegant, and novel combination of features,'" 119 Fed. Appx., at 290, compared to Rixon, and from another expert that claim 4 was nonobvious because, unlike in Rixon, the sensor was mounted on the support bracket rather than the pedal itself. This evidence, the court concluded, sufficed to require a trial.

II

A

We begin by rejecting the rigid approach of the Court of Appeals. Throughout this Court's engagement with the question of obviousness, our cases have set forth an expansive and flexible approach inconsistent with the way the Court of Appeals applied its TSM test here. To be sure, *Graham* recognized the need for "uniformity and definiteness." 383 U. S., at 18. Yet the principles laid down in *Graham* reaffirmed the "functional approach" of *Hotchkiss*, 11 How. 248. See 383 U. S., at 12. To this end, *Graham* set forth a broad inquiry and invited courts, where appropriate, to look at any secondary considerations that would prove instructive. *Id.*, at 17.

Neither the enactment of §103 nor the analysis in *Graham* disturbed this Court's earlier instructions concerning the need for caution in granting a patent based on the combination of elements found in the prior art. For over a

half century, the Court has held that a "patent for a combination which only unites old elements with no change in their respective functions . . . obviously withdraws what is already known into the field of its monopoly and diminishes the resources available to skillful men." *Great Atlantic & Pacific Tea Co.* v. *Supermarket Equipment Corp.*, 340 U. S. 147, 152 (1950). This is a principal reason for declining to allow patents for what is obvious. The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. Three cases decided after *Graham* illustrate the application of this doctrine.

In *United States* v. *Adams*, 383 U. S. 39, 40 (1966), a companion case to *Graham*, the Court considered the obviousness of a "wet battery" that varied from prior designs in two ways: It contained water, rather than the acids conventionally employed in storage batteries; and its electrodes were magnesium and cuprous chloride, rather than zinc and silver chloride. The Court recognized that when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result. 383 U. S., at 50–51. It nevertheless rejected the Government's claim that Adams's battery was obvious. The Court relied upon the corollary principle that when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious. *Id.*, at 51–52. When Adams designed his battery, the prior art warned that risks were involved in using the types of electrodes he employed. The fact that the elements worked together in an unexpected and fruitful manner supported the conclusion that Adams's design was not obvious to those skilled in the art.

In *Anderson's-Black Rock, Inc.* v. *Pavement Salvage Co.*, 396 U. S. 57 (1969), the Court elaborated on this approach.

The subject matter of the patent before the Court was a device combining two pre-existing elements: a radiant-heat burner and a paving machine. The device, the Court concluded, did not create some new synergy: The radiant-heat burner functioned just as a burner was expected to function; and the paving machine did the same. The two in combination did no more than they would in separate, sequential operation. *Id.*, at 60–62. In those circumstances, "while the combination of old elements performed a useful function, it added nothing to the nature and quality of the radiant-heat burner already patented," and the patent failed under §103. *Id.,* at 62 (footnote omitted).

Finally, in *Sakraida* v. *AG Pro, Inc.*, 425 U. S. 273 (1976), the Court derived from the precedents the conclusion that when a patent "simply arranges old elements with each performing the same function it had been known to perform" and yields no more than one would expect from such an arrangement, the combination is obvious. *Id.*, at 282.

The principles underlying these cases are instructive when the question is whether a patent claiming the combination of elements of prior art is obvious. When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, §103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Sakraida* and *Anderson's-Black Rock* are illustrative—a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

Following these principles may be more difficult in other

cases than it is here because the claimed subject matter may involve more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement. Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit. See *In re Kahn*, 441 F. 3d 977, 988 (CA Fed. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness"). As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

B

When it first established the requirement of demonstrating a teaching, suggestion, or motivation to combine known elements in order to show that the combination is obvious, the Court of Customs and Patent Appeals captured a helpful insight. See *Application of Bergel,* 292 F. 2d 955, 956–957 (1961). As is clear from cases such as *Adams*, a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established

functions, it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.

Helpful insights, however, need not become rigid and mandatory formulas; and when it is so applied, the TSM test is incompatible with our precedents. The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way. In many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature, will drive design trends. Granting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility.

In the years since the Court of Customs and Patent Appeals set forth the essence of the TSM test, the Court of Appeals no doubt has applied the test in accord with these principles in many cases. There is no necessary inconsistency between the idea underlying the TSM test and the *Graham* analysis. But when a court transforms the general principle into a rigid rule that limits the obviousness inquiry, as the Court of Appeals did here, it errs.

C

The flaws in the analysis of the Court of Appeals relate

for the most part to the court's narrow conception of the obviousness inquiry reflected in its application of the TSM test. In determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls. What matters is the objective reach of the claim. If the claim extends to what is obvious, it is invalid under §103. One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims.

The first error of the Court of Appeals in this case was to foreclose this reasoning by holding that courts and patent examiners should look only to the problem the patentee was trying to solve. 119 Fed. Appx., at 288. The Court of Appeals failed to recognize that the problem motivating the patentee may be only one of many addressed by the patent's subject matter. The question is not whether the combination was obvious to the patentee but whether the combination was obvious to a person with ordinary skill in the art. Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.

The second error of the Court of Appeals lay in its assumption that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem. *Ibid.* The primary purpose of Asano was solving the constant ratio problem; so, the court concluded, an inventor considering how to put a sensor on an adjustable pedal would have no reason to consider putting it on the Asano pedal. *Ibid.* Common sense teaches, however, that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a

puzzle. Regardless of Asano's primary purpose, the design provided an obvious example of an adjustable pedal with a fixed pivot point; and the prior art was replete with patents indicating that a fixed pivot point was an ideal mount for a sensor. The idea that a designer hoping to make an adjustable electronic pedal would ignore Asano because Asano was designed to solve the constant ratio problem makes little sense. A person of ordinary skill is also a person of ordinary creativity, not an automaton.

The same constricted analysis led the Court of Appeals to conclude, in error, that a patent claim cannot be proved obvious merely by showing that the combination of elements was "obvious to try." *Id.*, at 289 (internal quotation marks omitted). When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under §103.

The Court of Appeals, finally, drew the wrong conclusion from the risk of courts and patent examiners falling prey to hindsight bias. A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning. See *Graham*, 383 U. S., at 36 (warning against a "temptation to read into the prior art the teachings of the invention in issue" and instructing courts to "'guard against slipping into the use of hindsight'" (quoting *Monroe Auto Equipment Co.* v. *Heckethorn Mfg. & Supply Co.*, 332 F. 2d 406, 412 (CA6 1964))). Rigid preventative rules that deny factfinders recourse to common sense, however, are neither necessary under our case law nor consistent with it.

We note the Court of Appeals has since elaborated a

broader conception of the TSM test than was applied in the instant matter. See, *e.g., DyStar Textilfarben GmbH & Co. Deutschland KG* v. *C. H. Patrick Co.*, 464 F. 3d 1356, 1367 (2006) ("Our suggestion test is in actuality quite flexible and not only permits, but *requires*, consideration of common knowledge and common sense"); *Alza Corp.* v. *Mylan Labs., Inc.*, 464 F. 3d 1286, 1291 (2006) ("There is flexibility in our obviousness jurisprudence because a motivation may be found *implicitly* in the prior art. We do not have a rigid test that requires an actual teaching to combine . . ."). Those decisions, of course, are not now before us and do not correct the errors of law made by the Court of Appeals in this case. The extent to which they may describe an analysis more consistent with our earlier precedents and our decision here is a matter for the Court of Appeals to consider in its future cases. What we hold is that the fundamental misunderstandings identified above led the Court of Appeals in this case to apply a test inconsistent with our patent law decisions.

III

When we apply the standards we have explained to the instant facts, claim 4 must be found obvious. We agree with and adopt the District Court's recitation of the relevant prior art and its determination of the level of ordinary skill in the field. As did the District Court, we see little difference between the teachings of Asano and Smith and the adjustable electronic pedal disclosed in claim 4 of the Engelgau patent. A person having ordinary skill in the art could have combined Asano with a pedal position sensor in a fashion encompassed by claim 4, and would have seen the benefits of doing so.

A

Teleflex argues in passing that the Asano pedal cannot be combined with a sensor in the manner described by

claim 4 because of the design of Asano's pivot mechanisms. See Brief for Respondents 48–49, and n. 17. Therefore, Teleflex reasons, even if adding a sensor to Asano was obvious, that does not establish that claim 4 encompasses obvious subject matter. This argument was not, however, raised before the District Court. There Teleflex was content to assert only that the problem motivating the invention claimed by the Engelgau patent would not lead to the solution of combining of Asano with a sensor. See Teleflex's Response to KSR's Motion for Summary Judgment of Invalidity in No. 02–74586 (ED Mich.), pp. 18–20, App. 144a–146a. It is also unclear whether the current argument was raised before the Court of Appeals, where Teleflex advanced the nonspecific, conclusory contention that combining Asano with a sensor would not satisfy the limitations of claim 4. See Brief for Plaintiffs-Appellants in No. 04–1152 (CA Fed.), pp. 42–44. Teleflex's own expert declarations, moreover, do not support the point Teleflex now raises. See Declaration of Clark J. Radcliffe, Ph.D., Supplemental App. 204–207; Declaration of Timothy L. Andresen, *id.,* at 208–210. The only statement in either declaration that might bear on the argument is found in the Radcliffe declaration:

> "Asano . . . and Rixon . . . are complex mechanical linkage-based devices that are expensive to produce and assemble and difficult to package. It is exactly these difficulties with prior art designs that [Engelgau] resolves. The use of an adjustable pedal with a single pivot reflecting pedal position combined with an electronic control mounted between the support and the adjustment assembly at that pivot was a simple, elegant, and novel combination of features in the Engelgau '565 patent." *Id.,* at 206, ¶16.

Read in the context of the declaration as a whole this is best interpreted to mean that Asano could not be used to

solve "[t]he problem addressed by Engelgau '565[:] to provide a less expensive, more quickly assembled, and smaller package adjustable pedal assembly with electronic control." *Id.*, at 205, ¶10.

The District Court found that combining Asano with a pivot-mounted pedal position sensor fell within the scope of claim 4. 298 F. Supp. 2d, at 592–593. Given the sigificance of that finding to the District Court's judgment, it is apparent that Teleflex would have made clearer challenges to it if it intended to preserve this claim. In light of Teleflex's failure to raise the argument in a clear fashion, and the silence of the Court of Appeals on the issue, we take the District Court's conclusion on the point to be correct.

B

The District Court was correct to conclude that, as of the time Engelgau designed the subject matter in claim 4, it was obvious to a person of ordinary skill to combine Asano with a pivot-mounted pedal position sensor. There then existed a marketplace that created a strong incentive to convert mechanical pedals to electronic pedals, and the prior art taught a number of methods for achieving this advance. The Court of Appeals considered the issue too narrowly by, in effect, asking whether a pedal designer writing on a blank slate would have chosen both Asano and a modular sensor similar to the ones used in the Chevrolet truckline and disclosed in the '068 patent. The District Court employed this narrow inquiry as well, though it reached the correct result nevertheless. The proper question to have asked was whether a pedal designer of ordinary skill, facing the wide range of needs created by developments in the field of endeavor, would have seen a benefit to upgrading Asano with a sensor.

In automotive design, as in many other fields, the interaction of multiple components means that changing one

component often requires the others to be modified as well. Technological developments made it clear that engines using computer-controlled throttles would become standard. As a result, designers might have decided to design new pedals from scratch; but they also would have had reason to make pre-existing pedals work with the new engines. Indeed, upgrading its own pre-existing model led KSR to design the pedal now accused of infringing the Engelgau patent.

For a designer starting with Asano, the question was where to attach the sensor. The consequent legal question, then, is whether a pedal designer of ordinary skill starting with Asano would have found it obvious to put the sensor on a fixed pivot point. The prior art discussed above leads us to the conclusion that attaching the sensor where both KSR and Engelgau put it would have been obvious to a person of ordinary skill.

The '936 patent taught the utility of putting the sensor on the pedal device, not in the engine. Smith, in turn, explained to put the sensor not on the pedal's footpad but instead on its support structure. And from the known wire-chafing problems of Rixon, and Smith's teaching that "the pedal assemblies must not precipitate any motion in the connecting wires," Smith, col. 1, lines 35–37, Supplemental App. 274, the designer would know to place the sensor on a nonmoving part of the pedal structure. The most obvious nonmoving point on the structure from which a sensor can easily detect the pedal's position is a pivot point. The designer, accordingly, would follow Smith in mounting the sensor on a pivot, thereby designing an adjustable electronic pedal covered by claim 4.

Just as it was possible to begin with the objective to upgrade Asano to work with a computer-controlled throttle, so too was it possible to take an adjustable electronic pedal like Rixon and seek an improvement that would avoid the wire-chafing problem. Following similar steps to

those just explained, a designer would learn from Smith to avoid sensor movement and would come, thereby, to Asano because Asano disclosed an adjustable pedal with a fixed pivot.

Teleflex indirectly argues that the prior art taught away from attaching a sensor to Asano because Asano in its view is bulky, complex, and expensive. The only evidence Teleflex marshals in support of this argument, however, is the Radcliffe declaration, which merely indicates that Asano would not have solved Engelgau's goal of making a small, simple, and inexpensive pedal. What the declaration does not indicate is that Asano was somehow so flawed that there was no reason to upgrade it, or pedals like it, to be compatible with modern engines. Indeed, Teleflex's own declarations refute this conclusion. Dr. Radcliffe states that Rixon suffered from the same bulk and complexity as did Asano. See *id.,* at 206. Teleflex's other expert, however, explained that Rixon was itself designed by adding a sensor to a pre-existing mechanical pedal. See *id.,* at 209. If Rixon's base pedal was not too flawed to upgrade, then Dr. Radcliffe's declaration does not show Asano was either. Teleflex may have made a plausible argument that Asano is inefficient as compared to Engelgau's preferred embodiment, but to judge Asano against Engelgau would be to engage in the very hindsight bias Teleflex rightly urges must be avoided. Accordingly, Teleflex has not shown anything in the prior art that taught away from the use of Asano.

Like the District Court, finally, we conclude Teleflex has shown no secondary factors to dislodge the determination that claim 4 is obvious. Proper application of *Graham* and our other precedents to these facts therefore leads to the conclusion that claim 4 encompassed obvious subject matter. As a result, the claim fails to meet the requirement of §103.

We need not reach the question whether the failure to

disclose Asano during the prosecution of Engelgau voids the presumption of validity given to issued patents, for claim 4 is obvious despite the presumption. We nevertheless think it appropriate to note that the rationale underlying the presumption—that the PTO, in its expertise, has approved the claim—seems much diminished here.

IV

A separate ground the Court of Appeals gave for reversing the order for summary judgment was the existence of a dispute over an issue of material fact. We disagree with the Court of Appeals on this point as well. To the extent the court understood the *Graham* approach to exclude the possibility of summary judgment when an expert provides a conclusory affidavit addressing the question of obviousness, it misunderstood the role expert testimony plays in the analysis. In considering summary judgment on that question the district court can and should take into account expert testimony, which may resolve or keep open certain questions of fact. That is not the end of the issue, however. The ultimate judgment of obviousness is a legal determination. *Graham*, 383 U. S., at 17. Where, as here, the content of the prior art, the scope of the patent claim, and the level of ordinary skill in the art are not in material dispute, and the obviousness of the claim is apparent in light of these factors, summary judgment is appropriate. Nothing in the declarations proffered by Teleflex prevented the District Court from reaching the careful conclusions underlying its order for summary judgment in this case.

* * *

We build and create by bringing to the tangible and palpable reality around us new works based on instinct, simple logic, ordinary inferences, extraordinary ideas, and sometimes even genius. These advances, once part of our

shared knowledge, define a new threshold from which innovation starts once more. And as progress beginning from higher levels of achievement is expected in the normal course, the results of ordinary innovation are not the subject of exclusive rights under the patent laws. Were it otherwise patents might stifle, rather than promote, the progress of useful arts. See U. S. Const., Art. I, §8, cl. 8. These premises led to the bar on patents claiming obvious subject matter established in *Hotchkiss* and codified in §103. Application of the bar must not be confined within a test or formulation too constrained to serve its purpose.

KSR provided convincing evidence that mounting a modular sensor on a fixed pivot point of the Asano pedal was a design step well within the grasp of a person of ordinary skill in the relevant art. Its arguments, and the record, demonstrate that claim 4 of the Engelgau patent is obvious. In rejecting the District Court's rulings, the Court of Appeals analyzed the issue in a narrow, rigid manner inconsistent with §103 and our precedents. The judgment of the Court of Appeals is reversed, and the case remanded for further proceedings consistent with this opinion.

It is so ordered.

RELATED PROCEEDINGS APPENDIX

None.